Pinellas County Schools

GRADE 6 MATHEMATICS ADVANCED

2015-2016

August 2015	Building Community in the Math Classroom	Unit 9: Statisitical Measures	January 2016
1		MAFS.6.SP.1.1 MAFS.6.SP.2.5b,c,d	6 7 8 9
2 3 4 5 6 7 8	Unit 1: Compute with Multi-Digit Numbers	MAFS.6.SP.1.3	10 <mark>11 12 13</mark> 14 15 16
9 <mark>10 11 12 13 14</mark> 15	MAFS.6.NS.2.2 <u>MAFS.6.NS.2.3</u>	Unit 10: Statistical Displays	17 <mark>18</mark> 19 20 21 22 23
16 <mark>1718192021</mark> 22	Unit 2: Mulitply and Divide Fractions	MAFS.6.SP.1.2 MAFS.6.SP.2.5	24 25 26 27 28 29 30
23 <mark>24</mark> <mark>25 26 27 28</mark> 29	MAFS.6.NS.1.1 MAFS.6.RP.1.3d	MAFS.6.SP.2.4	31
30 31	Unit 3: Integers and the Coordinate Plane	Unit 11: Area	February 2016
September 2015	MAFS.6.NS.3.5 MAFS.6.NS.3.7	MAFS.6.G.1.1 MAFS.6.NS.3.8	1 2 3 4 5 6
1 2 3 4 5	MAFS.6.NS.3.6 <u>MAFS.6.NS.3.8</u>	MAFS.6.G.1.3	7 8 9 10 11 12 13
6 <mark>7</mark> 8 9 10 11 12	Unit 4: Ratios and Rates	Unit 12: Volume and Surface Area	14 <mark>15</mark> 16 17 18 19 20
13 14 15 16 17 18 19	MAFS.6.RP.1.1 MAFS.6.RP.1.3a,b,e	MAFS.6.G.1.2 MAFS.6.G.1.4	21 22 23 24 25 26 27
20 21 22 23 24 25 26	MAFS.6.RP.1.2 <u>MAFS.6.NS.2.4</u>	Unit 13: Ratios and Proportional Reasoning	28 29
27 28 29 30	Unit 5: Fractions, Decimals, and Percents	MAFS.7.RP.1.1 MAFS.7.RP.1.3	March 2016
October 2015	MAFS.6.RP.1.3c	MAFS.7.RP.1.2 MAFS.7.NS.1.3	1 2 3 4 5
1 2 3	Unit 6: Expressions	Unit 14: Percents	6 7 8 9 10 11 12
4 5 6 7 8 9 10	MAFS.6.EE.1.1 MAFS.6.EE.2.6	MAFS.7.RP.1.2c,d MAFS.7.EE.1.2	13 <mark>14</mark> 15 16 17 18 19
11 12 13 14 15 16 17	MAFS.6.EE.1.2 MAFS.6.NS.2.3	MAFS.7.RP.1.3 MAFS.7.EE.2.3	20 <mark>21 22 23 24 25</mark> 26
18 19 20 21 22 23 24	MAFS.6.EE.1.3 MAFS.6.NS.2.4	Unit 15: Integers	27 28 28 30 31
25 26 27 28 29 30 31	MAFS.6.EE.1.4	MAFS.7.NS.1.1 MAFS.7.NS.1.3	April 2016
November 2015	Unit 7: Equations	MAFS.7.NS.1.2a,b,c MAFS.7.EE.2.3	1 2
1 2 3 4 5 6 7	MAFS.6.EE.2.5 MAFS.6.RP.1.3	FSA Testing Window	3 4 5 6 7 8 9
8 9 10 11 12 13 14	<u>MAFS.6.EE.2.7</u>	April 11, 2016-May6, 2016	10 <mark>11 12 13 14 15</mark> 16
15 16 17 18 19 20 21	Unit 8: Functions and Inequalities	Unit 16: Rational Numbers	17 18 19 20 21 22 23
22 23 24 25 26 27 28	MAFS.6.EE.1.2C MAFS.6.EE.2.8	MAFS.7.NS.1.1b,c,d MAFS.7.RP.1.3	24 <mark>25 26 27 28 29</mark> 30
29 30	MAFS.6.EE.2.5 MAFS.6.EE.3.9	MAFS.7.NS.1.2 MAFS.7.EE.2.3	May 2016
D	MAFS.6.EE.2.6	MAFS.7.NS.1.3	1 2 3 4 5 6 /
December 2015	Semester 1 Review and Exam		8 9 10 11 12 13 14
	All standards from first semester	MAFS.7.EE.1.1 MAFS.7.NS.1.3	15 16 17 18 19 20 21
6 / 8 9 10 11 12	Re-Building Community in the Math Classroom	MAF5.7.EE.1.2	
			29 30 31
20 21 22 23 24 25 26			
27 20 29 50 51	4		
3 4 5	J		19 20 21 22 23 24 25
			26 27 28 29 30

Grade 6 Math, Adv	Unit 1: Compute with Multi-Digi	umbers	Projected Time	
Semester 1				Allotment: 8 Days
Sta	andards/Learning Goals:		Content Limits,	Assessment Types, Calculator
MAFS.6.NS.2.2 Fluently divalgorithm.	vide multi-digit numbers using the standard	• Cal	Items may only digit divisors or digit divisor. Numbers in ite rational numbe culator: NO	y have 5-digit dividends divided by 2- r 4-digit dividends divided by 2- or 3- ms are limited to non-decimal ers.
			Multiple Choice	e
MAFS.6.NS.2.3 Fluently ac decimals using the standar	ld, subtract, multiply, and divide multi-digit d algorithm for each operation.	•	Numbers in ite Items may inclu Items may be s	ms must be rational numbers. ude values to the thousandths place. set up in standard algorithm form.
		Cal	culator: NO	
		•	Equation Editor Multiple Choice	r e

Learning Targets/F	ound	lational Knowledge
MAFS.6.NS.2.2		
 Students can fluently divide multi-digit whole nul 	nbe	rs using the standard algorithm.
Instructiona	l Res	sources
Illustrative Mathematics Assessment Tasks		Lesson Resources
Interpreting a Division Computation Use the computation	٠	McGraw-Hill
shown below to find the products		 Course 1, Chapter 3
How many staples? Perform long division with a remainder in	٠	Illuminations
context. <u>Batting Average</u> Perform and analyze division with whole numbers in a sports context.		 <u>The Quotient Café</u> This applet illustrates partial quotient division and remainders by the division of food to aliens, dinosaurs, penguins and more.
	٠	CPalms
		 Dividing Decimals Investigations Students test how the basic operations performed on the dividend and divisor affect the quotient of a pair of numbers.
	•	MARS/Shell
		 Using Standard Algorithms Make sense of standard algorithms for addition, subtraction, multiplication and division of positive integers.
	•	Annenberg Learner
		 Area Models for Multiplication and Division "Division with Manipulatives": This applet helps students understanding division of multi-digit numbers using manipulatives.

Learning Targets/Fou	ndatio	nal Knowledge	9
MAFS.6.NS.2.3			
• Students can add multi-digit decimals using the s	tanda	rd algorithm	۱.
 Students can subtract multi-digit decimals using t 	he st	andard algoi	rithm.
 Students can multiply multi-digit decimals using t 	he st	andard algor	rithm.
 Students can divide multi-digit decimals using the 	star	dard algorit	hm
Instructiona	al Reso	urces	
Illustrative Mathematics Assessment Tasks			Lesson Resources
Reasoning about Multiplication and Division and Place	•	McGraw-Hil	I
Value, Part 1 Develop reasoning and estimation strategies in order to		o Cou	rse 1, Chapter 3
support algorithmic computations.	•	CPalms	
Reasoning about Multiplication and Division and Place		o Whe	ere Will We Stay? Students explore lodging
Value, Part 2 Develop reasoning and estimation strategies in order to		optio	ns for their dream family vacation. Students will plan a
support algorithmic computations.		vacat	ion for a family of four. With a budget of \$5,000
Jayden S Snacks Add and subtract multi-digit decimals in the context of		transi	portation, lodging, and attractions.
BUVING Gas Recognizing contexts and compute division of multi- digit		o Flor	ida Food Round Up! Students will practice
decimals.		using	a grocery list with a predetermined budget as they
6.NS Gifts from Grandma, Variation 3 Multiply and divide		add a	nd subtract decimals.
multi-digit decimals in the context of money.		o <u>A Ta</u>	asty Treat In this lesson, students will be given a list
6.NS Movie Tickets Multiply and divide multi-digit decimals in the		of ing	redients and prices they must use to create their own
context of money and interpreting remainders. (This task supports financial		divide	e decimal numbers.
literacy)		o The	Mystery of Decimals In this lesson, students
<u>b.NS Setting Goals</u> Subtract and divide multi-digit decimals in the		reviev	w all four operations with decimals by solving
literacy)		probl	ems in real-world context.
···	•	MARS/Shell	
		o <u>Usir</u>	ng Standard Algorithms Make sense of
		stand and d	lard algorithms for addition, subtraction, multiplication

Grade 6 Math, Adv Semester 1	actions	Projected Time Allotment: 8 Days	
Sta	ndards/Learning Goals:	Content Limi	ts, Assessment Types, Calculator
MAFS.6.NS.1.1 Interpret a solve word problems invol by using visual fraction mo problem. For example, crea a visual fraction model to s between multiplication and because 3/4 of 8/9 is 2/3. much chocolate will each p chocolate equally? How mo yogurt? How wide is a rect and area 1/2 square mi.?	nd compute quotients of fractions, and ving division of fractions by fractions, e.g., dels and equations to represent the ate a story context for $(2/3) \div (3/4)$ and use show the quotient; use the relationship d division to explain that $(2/3) \div (3/4)=8/9$ (In general, $(a/b) \div (c/d) = ad/bc$.) How person get if 3 people share 1/2 lb of any 3/4-cup servings are in 2/3 of a cup of angular strip of land with length 3/4 mi.	 At least the unit fraction Dividing a uversa (e.g., Calculator: NO Equation Ec GRID Multiple Ch Multiselect 	divisor or dividend needs to be a non- it fraction by a whole number or vice $\frac{1}{2} \div q \text{ or } q \div \frac{1}{a}$ is below grade level itor
MAFS.6.RP.1.3 Use ratio a mathematical problems, e ratios, tape diagrams, dou d. Use ratio reasonin manipulate and tra multiplying or divis	nd rate reasoning to solve real-world and g., by reasoning about tables of equivalent ole number line diagrams, or equations. g to convert measurement units; ansform units appropriately when ding quantities.	 Rates can b with words. Units may b quantities. Percent fou Calculator: NO Equation Ec GRID Multiple Ch Table Item 	e expressed as fractions, with ":" or e the same or different across the two nd as a rate per 100. itor

MAFS.6.NS.1.1

- Students can compute quotients of fractions.
- Students can interpret the solution of fractions within the context of the problem.
- Students can solve word problems involving division of fractions by fraction.

Instructional Resources					
Mathematics Formative Assessments (MFAS)	Lesson Resources				
Fraction Division Students are asked to complete two fraction division problems – one with fractions and one with mixed numbers. Juicing Fractions Students are asked to write and evaluate a numerical expression involving division of fractions and mixed numbers to model and solve a word problem. Contextualizing Fraction Division Students are asked to write a story context for a given fraction division problem. Models of Fraction Division Students are asked to explain the relationship between a fraction division word problem and either a visual	 McGraw-Hill Course 1, Chapter 4 Illuminations Fractional Clothesline Students clip index cards with various proper fractions, improper fractions, and mixed numbers on the clothesline to visually see groupings. Students then play an estimation game with groups using the same principle. 				
model or an equation. Illustrative Mathematics Assessment Tasks Baking Cookies Students must first add fractions with familiar but unlike denominators then divide fractions by fractions. Cups of Rice Students use visuals to help understand the remainder and the fractional part of a mixed number answer. Dan's Division Strategy Students explore the meaning of fraction division and to connect it to what they know about whole-number division. Traffic Jam Students visualize division of fraction problems with contexts where the quantities involved are continuous.	 Dividing Fractions – Tackling Word Problems Students explore the foundation for dividing fractions as well as correctly solving word problems involving division of fractions. The Price is Right Students will analyze a collection of shipping boxes to determine which box will ship the most for the \$100 allowed. Dividing Fractions Students will explore the different methods available for dividing fractions through a student based investigation. Dividing by Fractions Discovery Students derive the algorithm for dividing fractions using visual fraction models and equations to represent the problem. 				

Learning Targets/F	ound	Indational Knowledge
MAFS.6.RP.1.3d		
 Students can use ratio reasoning to convert measurement 	sure	rement units.
 Students can manipulate and transform units appresented to the students of the st	orop	opriately when multiplying or dividing quantities.
Instructiona	al Res	Resources
Mathematics Formative Assessments (MFAS)		Lesson Resources
Comparing Rates Students are asked to solve rate problems given the	•	McGraw-Hill
time it takes each of two animals to run different distances.	•	• Course 1, Chapter 4
Measurement Conversion Students are asked to make unit		Illuminations
conversions. <u>Illustrative Mathematics Assessment Tasks</u> <u>Speed Conversion</u> Students perform a unit conversion in the context of speed while also focusing on the precision of the conversion factor. <u>Unit Conversion</u> Students study conversion between some volume and weight units.	•	 Do You Measure Up? Students identify which units of measurement are used to measure specific objects, and they learn to convert between units within the same system. Discovering Gallon Man Students practice making volume conversions in the customary system. CPalms <u>Real Estate Rental Agent MEA</u> Students will choose the best location for a family relocating and will consider all of the factors to make the best decision. <u>Orange Juice Conversion</u> Students will be able to convert measurements within systems and between systems. <u>Summer Road Trip</u> Using the map scale they find out how far they traveled, how much gas they used, and how much the gas costs. <u>Shopping and Conversion Word Problems</u> Presents students to convert between smaller and larger measurement units and use all four mathematical operations. Converting Units Through Dimensional
		Analysis (Virtual Manipulative) Students apply dimensional analysis to solve unit conversion problems.

Grade 6 Math, Adv Unit 3: Integers and the Coordina				ate Pla	ane	Projected Time
Semester 1					Allotment: 8 Days	
	Sta	andards/Learning Goals:		Conter	nt Limits, <i>I</i>	Assessment Types, Calculator
<u>MAFS.6.NS.3.5</u> Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g.; temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.		 Num Item an o Calculator Equa Mult Mult 	bers in iter s should no peration. : NO ation Editor tiple Choice ciselect	ns must be rational numbers. It require the students to perform		
MAFS. line. Ex previou negativ a.	6.NS.3.6 Understan tend number line d us grades to represe ve number coordina Recognize opposit	d a ration number as a point on the iagrams and coordinate axes famili ent points on the line and in the pla tes. e signs of numbers as indicating loc	e number ar from ne with cations	 Num Plott inclu quac Do n scale Calculator 	abers in iten ting of point ide some ne drant). tot exceed a es can vary. t NO	ns must be rational numbers. ts in the coordinate plane should egative values (not just first a 10 x 10 coordinate grid, though
b. c.	on opposite sides opposite of the op e.g., -(-3)=3, and the Understand signs of locations in quadra when two ordered the points are relat Find and position in horizontal or vertion pairs of integers and plane	of 0 on a number line; recognize the posite of a number is the number is nat 0 is its own opposite. of numbers in ordered pairs as indic ants of the coordinate plane; recog l pairs differ only by signs, the locat ted by reflections across one or boo ntegers and other rational number cal number line diagram; find and p nd other rational numbers on a coo	at the tself, nize that ions of th axes. s on a position ordinate	 Equa GRIE Mata Mult Mult 	ation Editor) ching Item iple Choice iselect	
ΜΛΕς	SNS 3 7 Understan	ding ordering and absolute value of	frational	• Num	bers in iter	ns must be positive and negative
numhe	rs			ratio	nal numbe	rs
a.	Interpret statemen relative position o For example, inter- to the right or -7 o Write, interpret, a numbers in real-w to express the fact	nts of inequality as statements about f two numbers on a number line dia pret -3>-7 as a statement that -3 is n a number line oriented from left to nd explain statements of order for orld contexts. For example, write -3 to that - $3^{\circ}C$ is warmer than -7°C.	ut the agram. <i>located</i> to right. rational 8°C>-7°C	Calculator Equa GRIC Mato Mult Open	: NO ation Editor ching Item tiple Choice tiselect n Response	· · · · · · · · · · · · · · · · · · ·
C.	Understand the ab distance from 0 or as magnitude for a world situation. Fo dollars, write -30 dollars.	osolute value of a rational number and the number line; interpret absolute positive or negative quantity in a rongetive example, for an account balance [=30 to describe the size of the deb	as its te value real- of -30 t in			
d.	Distinguish compa about order. For e. less than -30 dolla	risons of absolute value from state xample, recognize that an account i rs represents a debt greater than 30	ments balance 0 dollars.			

MAFS.6.NS.3.8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	 ASSESSED IN: MAFS.6.NS.3.6 Plotting of points in the coordinate plane should include some negative values (not just first quadrant). Numbers in must be positive or negative rational numbers. Do not use polygons/vertices. Do not exceed a 10 x 10 coordinate grid, though scales can vary.
	Calculator: NO
	Equation Editor
	GRID
	Matching Item
	Multiple Choice
	 Multiselect Graphic Response - Graphing

MAFS.6.NS.3.5

- Students can use positive and negative numbers to represent quantities in real world context including rational numbers.
- Students can explain the meaning of 0 in the context of a situation.
- Students explain that positive and negative numbers are used together to describe quantities having opposite directions or values.

Instructiona	al Resources
Mathematics Formative Assessments (MFAS)	Lesson Resources
Relative Fractions Students are given positive and negative fractions and asked to explain their meanings within the context of a problem. Relative Decimals Students are asked to explain the meaning of positive and negative decimals within the context of a problem. Relative Integers Students are asked to use numbers to represent gains/losses and to interpret the meaning of zero in the context of football. Rainfall Change Students are asked to interpret values given in a chart that represent positive and negative deviations from average rainfall.	 McGraw-Hill Course 1, Chapter 5 CPalms <u>Positive or Negative, It's All About</u> <u>Shopping!</u> This lesson introduces students to the concept of negative and positive integers as opposites and as indicators of movement, beginning with elevation and
Illustrative Mathematics Assessment TasksIt's Warmer in MiamiStudents to apply their knowledge of integersin a real-world context.Mile HighStudents interpret the meaning of signed numbers and reasonbased on that meaning in a context where the meaning of zero is alreadygiven by convention.	 <u>Positive, Zero, or Negative?</u> This lesson involves students using positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of zero in each situation. Better Lessons <u>Visualizing Integers in our World</u> This lesson helps students make connections between art, math, and
	the real world by making connections in their daily lives.

Learning Targets/Foundational Knowledge

MAFS.6.NS.3.6

- Students can understand the opposite sign shifts the number to the opposite side of zero on the number line.
- Students can understand the signs of numbers in ordered pairs indicates which quadrant the number is located in.
- Students can recognize that the opposite of the opposite of a number is the number itself.
- Student can recognize that zero is it's own opposite.
- Students can recognize that when ordered pairs differ only by signs, the locations of the points are related by reflection across one or both axes.
- Students can represent all rational numbers on a horizontal or vertical number line.
- Students can find and position pairs of integers and other rational numbers on a coordinate plane.

Instructiona	I Resources
Instructiona <u>Mathematics Formative Assessments (MFAS)</u> <u>Explaining Opposites</u> Students are asked to graph on a number line and to explain the relationship between a number and its opposite in terms of the number line. <u>Graphing on Cartesian Planes</u> Students are asked to graph points given their coordinates and describe the coordinates of graphed points when the axes have different scales. <u>Locating Quadrants</u> Students are asked to determine in what quadrant or on which axis, points described algebraically, are located. <u>Graphing Points in the Plane</u> Students are asked to graph points	I Resources Lesson Resources McGraw-Hill Course 1, Chapter 5 CPalms Modern Math Warfare The lesson uses the classroom as a coordinate plane then moves into plotting points on a graph. It culminates with a game based on the "Battleship" game. All parts of the standard are covered in this lesson. Bomb the Boat – Sink the Teacher's Elect In
given their coordinates and describe the coordinates of graphed points. Graphing Points on the Number Line Students are asked to find the coordinates of graphed points and graph points with rational coordinates on a number line. What is the Opposite? Students are asked about numbers and their opposites.	 Bomb the Boat - Sink the Teacher's Fleet! In this lesson, students learn about the four quadrants of a coordinate plane and how to plot points in those quadrants. MARS/Shell <u>Absolutely Integers</u> Students will graph positive and negative numbers on a number line.
Extending the Number Line Students understand that there is a need for negative numbers and to see that there is a natural representation of them on the number line. <u>Reflecting Points over Coordinate Axes</u> Students practice plotting points and their reflections. <u>Plotting Points in the Coordinate Plane</u> Students get experience labeling coordinate axes appropriately to plot a given set of points, which will mean choosing an appropriate scale. <u>Integers on the Number Line 2</u> Students get an understanding that taking the opposite of a negative number will produce a positive	

MAFS.6.NS.3.7

number with equal distance from 0.

- Students can identify absolute value of a number.
- Student can use inequalities to express the relationship between two rational numbers.
- Students can write statements using inequality symbols to compare rational numbers.
- Students can use inequality statements in context.
- Students can understand absolute value as the distance from zero.
- Students can distinguish comparisons of absolute value from statements about order.

Instructiona	I Resources
Mathematics Formative Assessments (MFAS)	Lesson Resources
Position of Numbers Students are asked to describe the positions of numbers relative to each other on a number line. Submarines Students are asked to write integers to represent quantities given in context and to relate the integers with an inequality. South Pole Students are asked to interpret an inequality relating two temperatures Visualizing Absolute Value Students are asked to identify a	 McGraw-Hill Course 1, Chapter 5 CPalms <u>Absolutely Integers</u> Students will graph on number line positive numbers and then negative numbers. MARS/Shell
Absolute value. <u>Absolute Altitudes</u> Students are asked to compare two elevations and their absolute values and then interpret these comparisons within a given real-world context. <u>Illustrative Mathematics Assessment Tasks</u>	 <u>Evaluating Statements About Number</u> <u>Operations</u> This lesson assesses student's understanding of properties of number operations and how they represent inequalities algebraically into words. <u>Introduction to Absolute Value</u> This lesson is designed to introduce students to the concept and usage of

Jumping Flea Students understand the absolute value of a number as its	absolute value.
distance from 0 on the number line.	 What Rides Can You Go On In this lesson students
Above and below sea level Students interpret signed numbers in a	connect inequalities to a real world application.
context as a magnitude and a direction and to make sense of the absolute	
value of a signed number as its magnitude.	
Integers on the Number Line 1 Students plot points on a	
horizontal number line and determine if the given inequality statements are	
true.	
Fractions on the Number Line Students plot fractions on a	
horizontal number line and determine if the given inequality statements are	
true.	
Comparing Temperatures Students compare signed numbers in a	
real-world context.	

MAFS.6.NS.3.8

- Students can solve real world problems by graphing points in all four quadrants of the coordinate plane.
- Students can use coordinates to find the distance between points with the same first or second coordinate.
- Students can use absolute value to find the distance between points with the same first or second coordinate.

Instructional Resources				
Mathematics Formative Assessments (MFAS)	Lesson Resources			
Mathematics Formative Assessments (MFAS) Garden Coordinates Students are given the coordinates of the vertices of a rectangle and are asked to graph the rectangle and find its perimeter. Bike Lot Coordinate Students are asked to graph two points given their coordinates and to find the coordinates of two other points given their coordinates and to find the coordinates of two other points so that the four points represent the vertices of a square. Garden Area Students are given coordinates of three vertices of a rectangle and asked to determine the fourth vertex and the area of the rectangle. Determine the Distance Students are given the coordinates of three vertices of three points (with the same x- or y-coordinate) and asked to determine the distance between pairs of points without graphing.	 McGraw-Hill Course 1, Chapter 5 CPalms <u>Coordinate Grids: The Key to the City -</u> solving real world problems using the <u>coordinate grid</u> In this lesson students use previous knowledge of graphing in a 4 quadrant coordinate grid and individually solve a real world problem involving finding distance on a coordinate grid. MARS/Shell <u>A Measure of Slope</u> This lesson unit assesses students' understanding of the four quadrants of the 			
Illustrative Mathematics Assessment Tasks	coordinate plane, and introduces them to a mathematical			
Distances Between Points Students solve mathematical problems	understanding of slope.			
using points in the coordinate plane.				

Grade 6 Math, Adv	rade 6 Math, Adv Unit 4: Ratios and Rates		Projected Time		
Semester 1	Semester 1		Allotment: 8 Days		
Standards/Learning Goals:		Content Limits, Assessment Types, Calculator			
MAFS.6.RP.1.1 Understand language to describe a rati example, "The ratio of win 2:1, because for every 2 wi candidate A received, cand	d the concept of a ratio and use ratio o relationship between two quantities. For gs to beaks in the bird house at the zoo was ngs there was 1 beak." "For every vote lidate C received nearly three votes."	 Whole number Ratios can be ewith words. Units may be tl quantities. Context itself de Limit use of pecalculator: NO 	rs should be used for the quantities. expressed as fractions, with ":", or he same or different across the two loes not determine the order. rcent to MAFS.6.RP.1.3c.		
		 Equation Edito GRID Multiple Choice Multiselect Open Response Table Item 	r e 2		
MAFS.6.RP.1.2 Understand with a ratio $a: b$ with $b \neq 0$ ratio relationship. For exar flour to 4 cups of sugar, so sugar." "We paid \$75 for 1 hamburger."	d the concept of a unit rate a/b associated), and use rate language in the context of a nple, "This recipe has a ratio of 3 cups of there is $\frac{3}{4}$ cup of flour for each cup of 5 hamburgers, which is a rate of \$5 per	 Items using the whole number: Rates can be evident with words. Units may be the quantities. Context itself de Name the amo other as long a Calculator: NO 	e comparison of a ratio will use s. xpressed as fractions, with ":" or he same or different across the two loes not determine the order. unt of either quantity in terms of the s one of the values is on unit.		
MAFS.6.RP.1.3 Use ratio a mathematical problems, e ratios, tape diagrams, dou	nd rate reasoning to solve real-world and g., by reasoning about tables of equivalent ble number line diagrams, or equations.	 Equation Edito Multiple Choice Multiselect Table Item Rates can be exwith words. Units may be the quantities. 	r e xpressed as fractions, with ":" or he same or different across the two		
 a. Make tables of equivalent tables, and plot the tables, and plot the Use tables to complete tables. Solve unit rate propriate tables to complete tables. Solve unit rate propriate tables to constant speet tawns, then at the tables? At what e. Understand the construmt of the construction of the tables. 	alvalent ratios relating quantities with asurements, find missing values in the e pairs of values on the coordinate plane. bare ratios. blems including those involving unit pricing d. For example, if it took 7 hours to mow 4 trate, how many lawns could be mowed in rate were lawns being mowed? ncept of Pi as the ratio of the circle to its diameter.	Quadrant I only Calculator: NO Equation Edito GRID Multiple Choice Table item	y for MAFS.6.RP.1.3a		
MAFS.6.NS.2.4 Find the gr numbers less than or equa two whole numbers less th property to express a sum common factor as a multip common factor. For examp	eatest common factor of two whole I to 100 and the least common multiple of an or equal to 10. Use the distributive of two whole numbers 1-100 with a le of a sum of two whole numbers with no ole, express 36 + 8 as (4(9+2).	Whole number Least common than or equal t Calculator: NO Equation Edito GRID Matching Item Multiple Choice	rs less than or equal to 100. multiple of two whole numbers less o 12. r		

Learning Targets/Foundational Knowledge			
MAFS.6.RP.1.1			
 Students can understand the concept of a ratio by comparing two quantities or measures. Students can express ratios in different forms. 			
 Student can use ratio language to describe a ratio 	o relationship between two quantities.		
 Students can use models to demonstrate the relationships of the relationships of	ationships between quantities.		
Instruction	al Resources		
Mathematics Formative Assessments (MFAS)Writing RatiosStudents are asked to write part-to-part and part-to- whole ratios using values given in a table.Interpreting RatiosStudents are asked to explain the meaning of ratios in the context of problems.Comparing TimeStudents are given a scenario involving an additive comparison of two quantities, asked to write a ratio, and explain its meaning.Comparing RectanglesStudents are asked to determine which of three given comparisons contains a correctly computed ratio in a context involving rectangles.	 <u>Lesson Resources</u> McGraw-Hill Course 1, Chapter 1 Illuminations <u>The Golden Ratio</u> Students examine different ratios to determine whether the Golden Ratio can be found in the human body. CPalms <u>The Concept of Ratios</u> This lesson introduces students to the term ratio, its meaning and use, and the various ways in which a ratio can be presented. 		
Illustrative Mathematics Assessment Tasks Games at Recess Students write sentences describing ratio relationships and use the appropriate symbolic notation for ratios. The Escalator, Assessment Variation This task is a multiple choice task that addresses what students know about ratios. Bag of Marbles Students develop fluency in their understanding of the relationship between fractions and ratios.	 <u>My Favorite Recipe</u> This lesson shows how ratios can be indicated in words such as "to", "for every", "out of every." 		

MAFS.6.RP.1.2

- Students can understand the concept of a unit rate with a ratio.
- Students can use rate language in the context of a ratio relationship.

Instructional Resources			
Mathematics Formative Assessments (MFAS)	Lesson Resources		
Writing Unit RatesStudents are given verbal descriptions of rates and asked to write them as unit rates.Identify Unit RatesStudents are asked to decide if given statements express unit rates.Explaining RatesStudents are asked to explain the meaning of given rates and identify any that are unit rates.Book RatesStudents write and explain the meaning of a ratio and corresponding unit rate in the context of a word problem.	 McGraw-Hill Course 1, Chapter 1 CPalms Pancakes Over a Campfire! Students will learn how to set up ratios and calculate unit rates using a recipe. Savvy Shopper This a culminating activity for unit rates that has students apply knowledge to purchasing groceries. Specifically how knowledge of unit rates can help save 		
Illustrative Mathematics Assessment TasksMangos for SaleStudents generate a classroom discussion about ratios and unit rates in context.Price per pound and pounds per dollarStudents develop the concept of unit rates.Riding at a Constant Speed, Assessment Variation Multiple choice task to gage student understanding of unit rates.The Escalator, Assessment Variation gage student understanding of unit rates.Hippos Love Pumpkins situations involving unusual units.Ticket Booth Students compare unit rates in a real world context.	 Moderstanding Rates and Unit Rates <u>Understanding Rates and Unit Rates</u> <u>Stations Activity</u>. The students will get the opportunity to work in stations to reinforce and deepen their understanding of rates and unit rates. 		

MAFS.6.RP.1.3a,b,e

- Students can make tables of equivalent ratios.
- Students can find missing values in tables.
- Students can plot pairs of values on the coordinate plane.
- Students can use tables to compare ratios.
- Student can solve unit rate problem. (including unit pricing and constant speed)
- Students can understand the concept of pi as the ratio of the circumference of a circle to its diameter.

Instructiona	
Mathematics Formative Assessments (MFAS)	Lesson Resources
Sara's Hike Students are asked to solve a problem involving ratios.	McGraw-Hill
Bargain Breakfast Students are given the prices of three different	 Course 1, Chapter 1
quantities of cereal and are asked to determine which is the best buy.	CPalms
Making CoffeeStudents are asked to write ratios equivalent to a given ratio.Party Punch - Comparing RatiosStudents are asked to compare ratios given in two different tables.Comparing RatesStudents are asked to solve rate problems given the time it takes each of two animals to run different distances.Measurement ConversionStudents are asked to make unit	 <u>Discovering the Magical Pi</u> In this lesson student use data on the circumference and diameter of various objects to calculate Pi. <u>But Mom, I Really Want an iPad!!!!! Part 1</u> A situational story is used to capture the students' interest and to help students create a visual for the relationship between quantities in a ratio.
conversions.	
Illustrative Mathematics Assessment Tasks	
Illustrative Mathematics Assessment Tasks Mixing Concrete Students practice solving ratio problems. Voting for Three, Variation 1 Students define simple ratios, apply their understanding of rations, and apply a known ratio to a new one. Voting for Three, Variation 2 Students practice solving simple ratios in a more complex situation. Voting for Three, Variation 3 Students solve ratio problems in context. Converting Square Units Students use reasoning to solve ratio problems. Dana's House Students use reasoning to solve conversion problems. Kendall's Vase - Tax Students practice solving percent problems. Currency Exchange Students use mathematics addressed in different standards in the same problem. Friends Meeting on Bicycles Students use reasoning to solve ratio problems in context. Running at a Constant Speed Students use reasoning to solve problems with equivalent ratios and unit rates from both sides of the ratio.	
context. <u>Running at a Constant Speed</u> Students use reasoning to solve problems with equivalent ratios and unit rates from both sides of the ratio. <u>Jim and Jesse's Money</u> Students solve ratio problems in a real world context.	

Learning Targets/Foundational Knowledge				
MAFS.6.NS.2.4				
• Students can find the greatest common factor of two whole numbers less than or equal to 100.				
• Students can find the least common multiple of t	wow	whole nu	mbers less than or equal to 12.	
• Students can use the distributive property to exp	ress	a sum of	f two whole numbers.	
Instructional Resources				
Mathematics Formative Assessments (MFAS)			Lesson Resources	
Greatest Common Factors Students are given two whole numbers	•	McGraw-Hill		
less than or equal to 100 and asked to find the greatest common factor.		0	Course 1, Chapter 1	
Least Common Factors Students are asked to find the least common	•	Illumina	ations	
multiple of 8 and 12 and to explain how they found their answers.		0	Distributing and Factoring Using Area	
Illustrative Mathematics Assessment Tasks			Students are given expressions representing area of a rectangle and	
Factors and Common Factors Students apply the concepts of	•	CPalms		
factors and common factors in a context. <u>Multiples and Common Multiples</u> Students apply the concepts of multiples and common multiples in a context. <u>Adding Multiples</u> Students use repeated reasoning and generalizing to solve problems involving multiples. <u>The Florist Shop</u> Students apply the concepts of factors and common factors in a context.		0	Factoring out the Greatest This lesson teaches students how to find the GCF and LCM by factoring. This is a different method than is normally seen in textbooks.	
		0	<u>Can You find the Relationship?</u> Students will take their understanding of GCF and LCM and apply them to solve word problems and demonstrate their understanding by creating posters.	
Bake Sale Students apply the concepts of factors and common factors in a context.		0	<u>Can you say that another way?</u> Students model how to express and addition problem using the distributive property.	
		0	Digesting the Distributive Property Students use the distributive property to express a sum of tow whole numbers 1-100.	
	•	MARS/S	Shell	
		0	Factors and Multiples This lesson unit is intended to help you to assess how well students are able to understand the meanings of the terms (GCF) and (ICM).	

Grade 6 Math, Adv	Unit 5: Fractions, Decimals and Percents		Projected Time		
Semester 1				Allotment: 8 Days	
Standards/Learning Goals:		C	Content Limits, Assessment Types, Calculator		
 MAFS.6.RP.1.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. 	• • Calo	 Rates can be expressed as fractions, with ":" or with words. Units may be the same or different across the two quantities. Percent found as a rate per 100. Calculator: NO 			
	• • •	Equation Edito GRID Multiple Choice Table Item	r e		

Learning Targets/Foundational Knowledge				
MAFS.6.RP.1.3c				
• Students can find the percent of a quantity as a r	 Students can find the percent of a quantity as a rate per 100. 			
• Students can solve percent problems.				
Instructional Resources				
Mathematics Formative Assessments (MFAS)	Lesson Resources			
Homework Time Students are asked to convert a given rate to an	McGraw-Hill			
equivalent rate out of 100.	 Course 1, Chapter 2 			
Finding the Whole Students are asked to find the whole given a part	CPalms			
	o Equivalent Fractions and Percents This lesson is			
	designed to give students their very first experience with			
	visual connection between fractions and percents.			
	 <u>Percents and Double Number Line</u> 			
	Diagrams and Tape Diagrams Students will be			
	using visual representations to help them solve percent problems.			

Grade 6 Math, Adv	Unit 6: Expressions			Projected Time
Semester 1				Allotment: 13 Days
St	andards/Learning Goals:	0	Content Limits,	Assessment Types, Calculator
MAFS.6.EE.1.1 Write and	evaluate numerical expressions involving	•	Whole number Whole number	bases. exponents
whole-number exponents		Calc	culator: NO	
		•	Equation Editor Multiple Choice Multiselect	r 9
MAFS.6.EE.1.2 Write, read	d, and evaluate expressions in which letters	•	Numbers in ite	ms must be rational numbers.
stand for numbers.		Calo	culator: NO	
 a. Write expressions with letters stand calculation "Subtr b. Identify parts of a (sum, term, produor more parts of a describe the expression view (8+7) as both c. Evaluate expression world problems. 	that record operations with numbers and ing for numbers. For example, express the act y from 5" as 5 –y. n expression using mathematical terms act, factor, quotient, coefficient); view one on expression as a single entity. For example, ession $2(8+7)$ as a product of two factors; in a single entity and a sum of two terms. Sons at specific values of their variables. Ins that arise from formulas used in real-	•	Equation Edito Multiple Choice Multiselect	r 2
world problems. F those involving wl order when there order (Order of O V=s3 and A=6s2 to with sides of lengt	Perform arithmetic operations, including hole-number exponents, in the conventional are no parentheses to specify a particular perations). For example, use the formulas of find the volume and surface area of a cube th $s=1/2$.			
MAFS.6.EE.1.3 Apply the	properties of operations to generate	•	Positive rationa	al numbers, values may include
equivalent expressions. Fo	or example, apply the distributive property to	•	Variables must	be included in the expression.
the expression 3(2+x) to p	roduce the equivalent expression 6+3x;	•	No rational nur	nber coefficients
apply the distributive prop	perty to the expression 24x+18y to produce	Calc	culator: NO	-
the equivalent expression	6(4x+3y); apply properties of operations to		Multiple Choice	
y+y+y to produce the equi	valent expression 3y.	•	Multiselect	
MAFS.6.EE.1.4 Identify wh	nen two expressions are equivalent (i.e.,	•	Numbers in ite	ms must be positive rational
when the two expressions	name the same number regardless of	•	Numbers. Variables must	be included in the expression.
which value is substituted	into them). For example, the expressions	Calo	culator: NO	
y+y+y and 3y are equivale	nt because they name the same number	•	Editing Task	
regardless of which numb	er y stands for.	•	Matching Item	
		•	Multiselect	=
MAFS.6.EE.2.6 use variabl	es to represent numbers and write	•	Numbers in ite	ms must be nonnegative rational
expressions when solving	a real-world or mathematical problem;		numbers.	et contain at loast one variable
understand that a variable	e can represent an unknown number, or,	• Calo	culator: NO	
depending on the purpose	e at hand, any number in a specified set.	• •	Equation Editor Multiple Choice Open Response	
MAFS.6.NS.2.3 Fluently ad decimals using the standa	dd, subtract, multiply, and divide multi-digit rd algorithm for each operation.	• • Calo	Numbers in ite Items may inclu Items may be s culator: NO	ms must be rational numbers. Jde values to the thousandths place. et up in standard algorithm form.
		•	Equation Editor	r
		•	Multiple Choice	2

MAFS.6.NS.2.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of	 Whole numbers less than or equal to 100. Least common multiple of two whole numbers less than or equal to 12.
two whole numbers less than or equal to 10. Use the distributive	Calculator: NO
property to express a sum of two whole numbers 1-100 with a	Equation Editor
common factor as a multiple of a sum of two whole numbers with no	• GRID
common factor. For example, express 36+8 as 4/9+2)	Matching Item
	Multiple Choice

MAFS.6.EE.1.1

- Students can create or write numerical expressions with whole-number exponents.
- Students can evaluate numerical expressions with whole-number exponents and positive rational number bases.

Instructional Resources			
Mathematics Formative Assessments (MFAS)	Lesson Resources		
Cube House Students are asked to write a numerical expression using	McGraw-Hill		
exponents. <u>Paul's Pennies</u> Students are asked to write and evaluate a numerical expression using exponents. <u>Evaluating Exponents</u> Students are asked to expand and evaluate exponential expressions containing whole number exponents. <u>Exponent Priorities</u> Students are asked to evaluate multi-step numerical expressions with exponents.	 Course 1, Chapter 6 CPalms <u>The Power of Exponents</u> An introductory lesson that allows students to explore the meaning behind the terms "squared" and "cubed" numbers. <u>It's Hip 2b^2 eXponent^s</u> Students will write and cimplify numerical and algobraic currections with whole 		
Illustrative Mathematics Assessment Tasks Seven to the What?!? Practice working with positive integer exponents and identify patterns in the last two digits of successive powers of the number seven. The Djinni's Offer Determine which would be more lucrative, accepting 50,000 gold coins, or one magical gold coin that doubles every day for 28 days. Watch out for Parentheses Evaluate three different expressions containing the same integers to see how the placement of parentheses will affect the solution.	 <u>Everything Balances Out in the End</u> Allows students to simplify numerical expressions using a balance scale applet. MARS/Shell <u>Laws of Arithmetic</u> Portion of lesson asks students to perform arithmetic operations, including those involving whole-number exponents. 		

Learning Targets/Foundational Knowledge

MAFS.6.EE.1.2

- Students can understand that letters (variables) stand for numbers in algebraic expressions.
- Students can write algebraic expressions involving the four operations from phrases and sentences.
- Students can use proper mathematical terms to identify different parts of an expression.
- Students can use order of operations to evaluate expressions using specific values for variables, including expressions that involve whole-number exponents.
- Students can evaluate expressions involving formulas used in real-world situations.

Instructional Resources			
Mathematics Formative Assessments (MFAS)	Lesson Resources		
Writing Expressions Students are asked to write expressions	McGraw-Hill Country 1 Character C		
Parts of Expressions Students are asked to identify key parts of	 Course 1, Chapter 6 CPalms 		
Substitution Resolution Students are asked to evaluate formulas for given values of the variables.	 <u>Decoding Word Phrases</u> This lesson is designed to help students decode word phrases and then translate them from word form into numerical form. 		
Illustrative Mathematics Assessment Tasks	 <u>Let's Translate</u> This lesson teaches students to translate verbal phrases into algebraic expressions. 		

Distance to School Write equivalent expressions to show the number of miles students travel while biking to school over a four week period. <u>Rectangle Perimeter 1</u> Write an algebraic expression that could be used to find the perimeter of a rectangle. Expressions, Phrases and Word Problems, Oh My! This lesson allows students to translate written phrases into algebraic expressions and vice versa, and analyze word problems.
 I'll Fly Today This lesson allows students to use the distance, rate, and time formula to calculate distances and total costs of different trips.

MARS/Shell

 Interpreting Algebraic Expressions This lesson unit is intended to assess how well students are able to translate between words, symbols, tables, and area representations of algebraic expressions.

Learning Targets/Foundational Knowledge

MAFS.6.EE.1.3

- Students can recognize different properties of the four operations.
- Students can apply the distributive property to write equivalent algebraic expressions.
- Students can apply the commutative property to write equivalent algebraic expressions.
- Students can apply the associative property to write equivalent algebraic expressions.

Instructional Resources				
<u>Mathematics Formative Assessments (MFAS)</u> <u>Generating Equivalent Expressions</u> Students are asked to write equivalent expressions using the Distributive Property. <u>Equal Sides, Equivalent Expressions</u> Students are asked to generate and justify an expression is equivalent to a given one using the properties of operations. <u>Associative and Commutative Expressions</u> Students are asked to write expressions equivalent to a given one by using the Associative and Commutative Properties. <u>Illustrative Mathematics Assessment Tasks</u> <u>Anna in D.C.</u> Challenge students to solve multi-step percentage problem using algebraic expressions and the distributive property (or a ratio table).	 Lesson Resources McGraw-Hill Course 1, Chapter 6 Illuminations Distributing and Factoring Using Area In this lesson, expressions representing area of a rectangle are used to enhance understanding of the distributive property. Join the Club: Identifying and Combining Like Terms In this lesson, students learn the definition of like terms and gain practice in identifying key features to sort and combine them. CPalms <u>Extending the Distributive Property</u> In this lesson, students will build upon their understanding of the distributive property using real-world situations and manipulatives. <u>Have You Met Your Match?</u> In this lesson, students will use the properties of operations to generate and identify equivalent expressions. <u>Collectively Collecting</u> In this lesson, students will examine and experience collecting like terms through an analogy to real world situations and the use of manipulatives. 			

	Learning Targets/Foundational Knowledge			
 MAFS.6.EE.1.4 Students can identify when two algebraic expressions are equivalent. Students can prove two expressions are equivalent by substituting different values for the variables to generate the same solution for both expressions when evaluated. 				
 Students can prove two expressions are equivalent 	t by citing different properties of operations.			
Instructional Mathematics Formative Assessments (MFAS) Identifying Equivalent Expressions Students are asked to identify expressions equivalent to a given expression and justify their responses. Equivalent Expressions Equivalent Expressions Students are asked to identify expressions equivalent to a given exponential expression and justify their responses. Equivalent Expressions Students are asked to determine if pairs of expressions are equivalent and to justify their responses. Property Combinations Students are asked to identify expressions equivalent to a given expression and justify their responses using properties of operations. Illustrative Mathematics Assessment Tasks Rectangle Perimeter 2 Determine which expressions out of a group of four are equivalent and can be used to calculate the perimeter of a rectangle accurately. Rectangle Perimeter 3 Compute the perimeter of a rectangle using two different algebraic expressions and explain why result is always the same. Equivalent Expressions Apply the distributive, commutative, and	 Lesson Resources McGraw-Hill Course 1, Chapter 6 CPalms <u>Total Recall</u> This lesson provides opportunities for students to apply different strategies and properties to expand, add, subtract, or multiply to determine equivalent expressions. <u>Equivalent Expressions</u> Students are asked to use properties of operations to match expressions that are equivalent and to write equivalent expressions for any expressions that do not have a match. <u>Extending to Symbols</u> In this investigation, students learn about the notion of equivalence in concrete and numerical settings. As students begin to use symbolic representations, they use variables as place holders or unknowns.			

MAFS.6.EE.2.6

- Students can use variables to represent numbers and write expressions from real-world situations.
- Students can understand that a variable can be used to represent an unknown number.
- Students can understand that a variable can also be used to represent any number in a specified set.

Mathematics Formative Assessments (MFAS)	Lesson Resources		
Inventing X situation to accompany an algebraic expression. Writing Real Work Expressions variables to write expressions that represent quantities described in context. Gavin's Pocket Students are asked to interpret the significance of a variable and its possible values when given a variable expression in a real- world context.	 McGraw-Hill Course 1, Chapter 6 Illuminations <u>Building Bridges</u> In this lesson, students transition from arithmetic to algebraic thinking by exploring problems that are not limited to single-solution responses. 		
	CPalms		
Illustrative Mathematics Assessment Tasks Firefighter Allocation Write and solve an equation to determine the	 <u>Chairs Around the Table</u> This lesson allows exploration into the use of variables, linear patterns, and writing expressions from real-world situations. 		
number of menginters a town can employ while staying within a budget.	 How Much Was Lunch? This lesson explores using substitution to solve real-world problems involving variables. 		

Learning Targets/Foundational Knowledge				
MAFS.6.NS.2.3 (Repeated from Unit 1)				
• Students can add multi-digit decimals using the s	tanc	ndard algorithm.		
 Students can subtract multi-digit decimals using t 	the s	e standard algorithm.		
 Students can multiply multi-digit decimals using t 	he s	e standard algorithm.		
 Students can divide multi-digit decimals using the 	e sta	tandard algorithm.		
Instructiona	al Re	lesources		
Illustrative Mathematics Assessment Tasks		Lesson Resources		
Reasoning about Multiplication and Division and Place	•	McGraw-Hill		
Value, Part 1 Develop reasoning and estimation strategies in order to		 Course 1, Chapter 6 		
support algorithmic computations.	CPalms			
Reasoning about Multiplication and Division and Place		• Where Will We Stay? Students explore lodging		
Value, Part 2 Develop reasoning and estimation strategies in order to		options for their dream family vacation. Students will plan a		
support algorithmic computations.		vacation for a family of four. With a budget of \$5,000		
<u>Dayuell's Shacks</u> Add and subtract multi-digit decimals in the context of money		transportation, lodging, and attractions.		
Buying Gas Recognizing contexts and compute division of multi- digit		 Florida Food Round Up! Students will practice 		
decimals.		using a grocery list with a predetermined budget as they		
Gifts from Grandma, Variation 3 Multiply and divide multi-digit		add and subtract decimals.		
decimals in the context of money.		O <u>A Tably ITeal</u> In this lesson, students will be given a list of ingredients and prices they must use to create their own.		
Movie Tickets Multiply and divide multi-digit decimals in the context of		snack mix. Students will have to add, subtract, multiply, and		
money and interpreting remainders. (This task supports financial literacy)		divide decimal numbers.		
<u>Setting Goals</u> Subtract and divide multi-digit decimals in the context of money and interpreting remainders. (This task supports financial literacy)		 <u>The Mystery of Decimals</u> In this lesson, students 		
noncy and interpreting remainders. (This task supports infancial interdey)		review all four operations with decimals by solving		
	• MARS/Shell			
		Using Standard Algorithms Make sense of		
		standard algorithms for addition, subtraction. multiplication		
		and division of positive integers.		

MAFS.6.NS.2.4 (Repeated from Unit 4)

- Students can find the greatest common factor of two whole numbers less that or equal to 100.
- Students can find the least common multiple of two whole numbers less that or equal to 12.
- Students can use the distributive property to express a sum of two whole numbers.

Instructional Resources

Mathematics Formative Assessments (MFAS)	Lesson Resources		
Greatest Common Factors Students are given two whole numbers	 McGraw-Hill 		
less than or equal to 100 and asked to find the greatest common factor.	 Course 1, Chapter 1 		
Least Common Factors Students are asked to find the least common	Illuminations		
multiple of 8 and 12 and to explain how they found their answers.	• Distributing and Factoring Using	Area	
Illustrative Mathematics Assessment Tasks	Students are given expressions representing rectangle and	area of a	
Factors and Common Factors Students apply the concepts of	CPalms		
factors and common factors in a context. <u>Multiples and Common Multiples</u> Students apply the concepts of multiples and common multiples in a context. <u>Adding Multiples</u> Students use repeated reasoning and generalizing to solve problems involving multiples. <u>The Florist Shop</u> Students apply the concepts of factors and common factors in a context. <u>Dates Sale such as a balance statement of the second statement</u> for the second statement of the second sta	 Factoring out the Greatest This less students how to find the GCF and LCM by This is a different method than is normally textbooks. Can You find the Relationship? S take their understanding of GCF and LCM them to solve word problems and demons understanding by creating posters. 	sson teaches y factoring. y seen in tudents will A and apply strate their	
Bake Sale Students apply the concepts of factors and common factors in a context.	 Can you say that another way? S model how to express and addition proble 	tudents em using the	
		-	

•	o MARS/	distributive property. <u>Digesting the Distributive Property</u> Students use the distributive property to express a sum of tow whole numbers 1-100. Shell
	0	Factors and Multiples This lesson unit is intended to help you to assess how well students are able to understand the meanings of the terms (GCF) and (LCM).

Grade 6 Math, Adv	Projected Time		
Semester 1		Allotment: 6 Days	
MAFS.6.EE.2.5 Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.		 Numbers in items must be nonnegative rational numbers. One-variable linear equations and inequalities. An equation or inequality should be given if a context is included. 	
		Calculator: NO Equation Editor Matching Item Multiple Choice Multiselect	
MAFS.6.EE.2.7 Solve real-world and mathematical problems by writing and solving equations of the form $x+p=q$ and $px=q$ for cases in which p , q , and x are all non-negative rational numbers.		 Numbers in items must be nonnegative rationa numbers. Items must be one-step linear equations with o variable. Calculator: NO 	al one
		Equation Editor Multiple Choice	
 MAFS.6.RP.1.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. 		 Rates can be expressed as fractions, with ":" or with words. Units may be the same or different across the two quantities. Percent found as a rate per 100. Quadrant I only for MAFS.6.RP.1.3a. 	
		Calculator: NO Equation Editor GRID Multiple Choice	
b. Solve unit rate pro and constant spee	blems including those involving unit pricing	Table Item	
 c. Find a percent of a quantity means 30 involving finding t 	a quantity as a rate per 100 (e.g., 30% of a D/100 times the quantity); solve problems he whole, given a part and the percent.		
d. Use ratio reasonir manipulate and tr multiplying or divi	g to convert measurement units; ansform units appropriately when ding quantities.		
e. Understand the co circumference of a	oncept of Pi as the ratio of the a circle to its diameter.		

MAFS.6.EE.2.5

- Students can understand that solving an equation means finding a value for the variable that makes the equation true.
- Students can use substitution to determine if a given number makes the equation true.

Instructional Resources			
Mathematics Formative Assessments (MFAS)		Lesson Resources	
Solutions of Equations Students are asked to explain what it means for a number to be a solution of an equation. Finding Solutions of Equations Students are given three equations and asked to determine if any numbers from a given set are solutions.	•	McGraw-Hill o Course 1, Chapter 7	
	•	IIIUMINATIONS O <u>Algebra in Balance</u> In this lesson, students begin with an exploration of Balance Pans to discover the balance of the left and right side of an equation.	
	•	CPalms	
		o Solving One-Step Equations Using Mental	

	<u>Math</u> In this lesson students will solve one-step equations using mental math and guess-and-check. Students will use number cubes to generate random numbers to test as solutions to the equations.
0	Bake Sale This lesson challenges student to develop and solve equations for mathematical and real-world situations.
 MARS/ 	Shell
0	Interpreting Equations This lesson is intended to help students uncover and address misconceptions concerning the meaning of variables in equations.

MAFS.6.EE.2.7

- Students can write equations for real-world and mathematical problems in the form *x*+*p*=*q* and *px*=*q* where all values are non-negative rational numbers.
- Students can use inverse operations to solve equations for real-world and mathematical problems in the form *x*+*p*=*q* and *px*=*q* where all values are non-negative rational numbers.

Instructional Resources

Mathematics Formative Assessments (MFAS)	Lesson Resources		
Equally Driven Students are asked to solve a real-world problem	McGraw-Hill		
involving distance driven by writing and solving an equation.		o Course 1, Chapter 7	
<u>Center Section</u> Students are asked to solve a real-world problem involving seats in an auditorium by writing and solving an equation. University Park Students are asked to solve a real-world problem	•	 Illuminations O <u>Geology Rocks Equations</u> In this lesson, students 	
involving parking spaces by writing and solving an equation.		explore linear equations with manipulatives and discover various steps used in solving equation problems.	
<u>Solar Solutions</u> Students are asked to solve a real-world problem involving solar panels by writing and solving an equation.		 Algebra Tiles Use tiles to represent variables and constants, solve equations, substitute in variable expressions, and expand and factor. 	
Illustrative Mathematics Assessment Tasks	•	CPalms	
Firefighter Allocation Write and solve an equation to determine the number of firefighters a town can employ while staying within a budget. Fruit Salad Determine the amounts of different kinds of fruits in a fruit salad using ratio reasoning or a linear equation. Morning Walk Write and solve an equation to determine how long a girl walks her dog in the morning using the total number of miles she walks the dog in a week.		 Control Equations with a Deck of Cards In this lesson, students learn about solving one- and two-step equations as well as how to use an equation to model information from a word problem. Solving Equations with Beans Students will use dried white and black beans to solve one-step equations with integer operations. Writing and Solving Equations from Real World Problems In this lesson, students will learn to write equations for given real world problems. They will eventually write their own problem, write the equation, then solve it. 	
	MARS/Shell		
		 Interpreting Equations This lesson is intended to help students connect algebraic equations to real-life situations. 	

Learning Targets/Foundational Knowledge

MAFS.6.RP.1.3 (Repeated from units 2, 4, and 5)

- Students can make tables of equivalent ratios.
- Students can find missing values in tables.
- Students can plot pairs of values on the coordinate plane.
- Students can use tables to compare ratios.
- Students can solve unit rate problems, including problems involving unit pricing and constant speed.
- Students can find the percent of a number as a rate per 100.

- Students can find a whole number, given a part of the number as a percent of the whole. •
- Students can use ratio reasoning to convert measurement units. •
- Students can manipulate and transform units appropriately when multiplying or dividing quantities.
- Students can understand that pi is a ratio of a circle's circumference to its diameter. •

Instructional Resources Mathematics Formative Assessments (MFAS) Lesson Resources Sara's Hike Students are asked to solve a problem involving ratios. McGraw-Hill Bargain Breakfast Students are given the prices of three different o Course 1, Chapter 7 quantities of cereal and are asked to determine which is the best buy. Illuminations Making Coffee Students are asked to write ratios equivalent to a given Do You Measure Up? Students identify which units 0 ratio. of measurement are used to measure specific objects, and Party Punch – Comparing Ratios Students are asked to compare they learn to convert between units within the same ratios given in two different tables. system. Homework Time Students are asked to convert a given rate to an Discovering Gallon Man Students practice making 0 equivalent rate out of 100. volume conversions in the customary system. Finding the Whole Students are asked to find the whole given a part Grid and Percent It In this lesson, students use a 10 × 0 and a percent. 10 grid as a model for solving various types of percent problems. Comparing Rates Students are asked to solve rate problems given the time it takes each of two animals to run different distances. **CPalms** Measurement Conversion Students are asked to make unit 0 All "Tired" Up In this lesson students will utilize conversions. mathematical computation skills involving percentages and critical thinking skills to select the best tire deals advertised. Illustrative Mathematics Assessment Tasks But Mom, I Really Want an IPad!!! Students 0 explore various solution strategies, including making tables Mixing Concrete Use a ratio to determine the amount of ingredients of equivalent ratios and writing an equation to find needed to make a specific amount of concrete. equivalent ratios. Shirt Sale Find the whole given a part as the percent of the whole. It's Carnival Time This lesson uses a carnival theme 0 Voting for Three Find ratios of votes to compare candidates in a that challenges students to calculate unit rates and make school election. measurement conversions to determine the best values for food. Kendall's Vase - Tax Calculate total price based on original price plus Money: How to Know Where It Is All Going 0 tax. This lesson will help students learn the importance of Exam Scores Determine percent of problems answered correctly on budgeting and the role percentages play in creating one, as exam and who scored higher. well as how they apply to our daily living. Speed Conversions Convert kilometers per hour to miles per hour to Square Circles This lesson will help students discover 0 compare speeds. pi as a constant ratio as they start by measuring squares, then move on to measuring circles. MARS/Shell Solving Real-Life Problems: Selling Soup This 0 lesson is intended to assess how well students can use proportional relationships to solve multistep ratio and percent problems.

Grade 6 Math, Adv	Projected Time			
Semester 1			Allotment: 8 Days	
Sta	ndards/Learning Goals:	Content Limits,	Assessment Types, Calculator	
MAFS.6.EE.1.2 Write, read	, and evaluate expressions in which letters	Numbers in ite	ems must be rational numbers.	
stand for numbers.		Calculator: NO		
c. Evaluate expressio	ns at specific values of their variables.	Equation Edito Multiple Choice		
Include expression	s that arise from formulas used in real-	Multiselect	e	
world problems. P	erform arithmetic operations, including			
those involving wh	ole-number exponents, in the conventional			
order when there	are no parentheses to specify a particular			
order (Order of Op	erations). For example, use the formulas			
$V = s^3$ and $A = 6$	s^2 to find the volume and surface area of a			
	1			
cube with sides of	length $s = \frac{1}{2}$.			
MAFS.6.EE.2.5 Understand	l solving an equation or inequality as a	Numbers in ite	ems must be nonnegative rational	
process of answering a que	estion: which values from a specified set, if	One-variable li	near equations and inequalities	
any, make the equation or	inequality true? Use substitution to	An equation or	r inequality should be given if a	
determine whether a giver	n number in a specified set makes an	context is inclu	ıded.	
equation or inequality true		Calculator: NO		
		Equation Edito	ır	
		Matching Item		
		Multiple Choice Multisoloct		
MAES 6 FE 2 6 use variable	es to represent numbers and write	Numbers in ite	ems must be nonnegative rational	
expressions when solving a	a real-world or mathematical problem:	numbers.	-	
understand that a variable	con represent on unknown number, or	Expressions m	ust contain at least one variable.	
depending on the purpose	at hand, any number in a specified set	Calculator: NO	r	
depending on the purpose	at hand, any humber in a specified set.	Equation Editor Multiple Choice		
		Open Respons	e	
MAFS.6.EE.2.8 Write an ine	equality of the form <i>x>c</i> or <i>x<c< i=""> to represent</c<></i>	Numbers in ite	ems must be nonnegative rational	
a constraint or condition ir	a real-world or mathematical problem.	numbers.	-world items should be continuous	
Recognize that inequalities	s of the form <i>x>c</i> or <i>x<c< i=""> have infinitely many</c<></i>	or close to continuous.		
solutions; represent solution	ons of such inequalities on number line	Calculator: NO		
diagrams.	·	Equation Edito	r	
		GRID Matching Item		
		Multiple Choic	e	
		Multiselect		
		Open Respons	e	
MAFS.6.EE.3.9 Use variable	es to represent two quantities in a real-	 Equation of the Numbers in its 	e form y=px or y=x+p.	
world problem that change	e in relationship to one another; write an	numbers (zero	can be used in graph and table).	
equation to express one qu	uantity, thought of as the dependent	Variables need	l to be defined.	
variable, in terms of the ot	her quantity, thought of as the	Relationships a	are to be continuous.	
independent variable. Ana	lyze the relationship between the	Calculator: NO	r	
dependent and independe	nt variables using graphs and tables, and	GRID	1	
relate these to the equation	n. For example, in a problem involving	Matching Item		
motion at constant speed,	list and graph ordered pairs of distances	Multiple Choic	e	
and times, and write the equation d=65t to represent the relationship		Multiselect Table Item		
between distance and time	· · · · ·			
	•			

Learning Targets/F	Foundational Knowledge		
 MAFS.6.EE.1.2.c (repeated from Unit 6) Students can use order of operations to evaluate expressions using specific values for variables, including expressions that involve whole-number exponents. Students can evaluate expressions involving formulas used in real-world situations. 			
Mathematics Formative Assessments (MFAS) Writing Expressions Students are asked to write expressions that record operations with numbers and variables. Parts of Expressions Students are asked to identify key parts of algebraic expressions. Substitution Resolution Students are asked to evaluate formulas for given values of the variables. Illustrative Mathematics Assessment Tasks Distance to School Write equivalent expressions to show the number of miles students travel while biking to school over a four week period. Rectangle Perimeter 1 Write an algebraic expression that could be used to find the perimeter of a rectangle.	 Lesson Resources McGraw-Hill Course 1, Chapter 8 CPalms I'll Fly Today This lesson allows students to use the distance, rate, and time formula to calculate distances and total costs of different trips. Feel the Heat! Students will use surface area formulas to make calculations and determine the cost of constructing buildings using different materials. MARS/Shell Laws of Arithmetic This lesson is intended to assess how well students can perform arithmetic operations, including those involving whole-number exponents, and write and evaluate numerical expressions. 		

MAFS.6.EE.2.5 (repeated from Unit 7)

- Students can understand that solving an inequality means finding a value for the variable that makes the inequality true.
- Students can use substitution to determine if a given number makes the inequality true.

Instructional Resources						
Mathematics Formative Assessments (MFAS)	Lesson Resources					
Solutions of Inequalities Students are asked to explain what it means for a number to be a solution of an inequality. Finding Solutions of Inequalities Students are given three inequalities and asked to determine if any numbers from a given set are solutions. Illustrative Mathematics Assessment Tasks Log Ride Solve an inequality to determine how many children can safely ride a log ride.	 McGraw-Hill Course 1, Chapter 8 CPalms <u>How Much Was Lunch?</u> This lesson explores using substitution to solve real-world problems involving variables. MARS/Shell <u>Evaluating Statements about Number</u> <u>Operations</u> This lesson is intended to assess how well students understand the properties of number operations and can substitute values into inequality statements to assess their validity. 					

Learning Targets/F	oundational Knowledge		
Learning Targets/Foundational Knowledge MAFS.6.EE.2.6 (repeated from Unit 6) • Students can use variables to represent numbers and write expressions from real-world situations. • Students can understand that a variable can be used to represent an unknown number. • Students can understand that a variable can also be used to represent any number in a specified set. Instructional Resources			
Mathematics Formative Assessments (MFAS) Inventing X Students are asked to write and explain a real-world situation to accompany an algebraic expression. Writing Real Work Expressions Students are asked to use variables to write expressions that represent quantities described in context. Gavin's Pocket Students are asked to interpret the significance of a variable and its possible values when given a variable expression in a real- world context.	Lesson Resources McGraw-Hill o Course 1, Chapter 8 Illuminations o <u>Building Bridges</u> In this lesson, students transition from arithmetic to algebraic thinking by exploring problems that are not limited to single-solution responses. CPalms		
Illustrative Mathematics Assessment Tasks <u>Firefighter Allocation</u> Write and solve an equation to determine the number of firefighters a town can employ while staying within a budget.	 Chairs Around the Table This lesson allows exploration into the use of variables, linear patterns, and writing expressions from real-world situations. How Much Was Lunch? This lesson explores using substitution to solve real-world problems involving variables. 		

MAFS.6.EE.2.8

- Students can write an inequality using the form x>c or x<c.
- Students can represent a constraint or condition in a real-world problem using the form x>c or x<c.
- Students can recognize that inequalities in the form x>c or x<c have an infinite amount of solutions.
- Students can graph inequalities on a number line to represent the solutions of the inequalities.

Instructional Resources					
Mathematics Formative Assessments (MFAS)	Lesson Resources				
Acres and Altitudes Students are given a context from which to write an inequality statement about acres and altitudes. <u>Roadway Inequalities</u> Students are given a context from which to write an inequality statement about lane widths and gas prices. <u>Transportation Number Lines</u> Students are given an inequality to graph and asked to list sample solutions. <u>Rational Number Lines</u> Students are given an inequality to graph and asked to select sample solutions.	 McGraw-Hill Course 1, Chapter 8 CPalms <u>Writing Inequalities to Represent Situations</u> In this lesson, students will learn how to write inequalities to represent situations and compare the solutions of inequalities to that of equations. <u>An Introduction to Solving and Graphing</u> Incomplications in the solutions of a lease of a data will be a solution. 				
Illustrative Mathematics Assessment Tasks Fishing Adventures 1 Write and graph inequalities to represent the total number of people and the total weight that a boat can hold. Height Requirements Write and graph inequalities to represent the height requirements of different rides at an amusement park.	 Inequalities In this three-day lesson, students will learn to solve and graph one- and two-step inequalities. MARS/Shell Evaluating Statements about Number Operations This lesson is intended to assess how well students understand the properties of number operations and can substitute values into inequality statements to assess their validity. 				

Learning Targets/Fo	oundational Knowledge
MAFS.6.EE.3.9	
 Students can use variables to represent quantities quantity's relationship with the other. Students can write an equation to express one quantity (the independent variable). Students can identify the dependent and independents can determine and describe the relation using tables and graphs. Students can write equations that demonstrate the variables in tables and graphs. 	is in real-world situations that change based on one uantity (the dependent variable) in terms of another indent variables in an equation. Inship between the dependent and independent variables he relationship between the dependent and independent
Instructiona	al Resources
Mathematics Formative Assessments (MFAS) Bicycling Equation Students are asked to write an equation from a real-world context and identify and describe the independent and dependent variables. Grinding Equations Students are asked to write equations from real- world contexts and identify the independent and dependent variables. Analyzing the Relationship Students are given an equation and asked to make a table of values and a graph, and asked to explain the relationship between the independent and dependent variables. Table to Equation Students are asked to write an equation that represents the relationship between two variables and to explain how the equation reflects the relationship. Illustrative Mathematics Assessment Tasks Chocolate Bar Sales Complete a table of values, write an equation from the table, identify the independent and dependent variables, graph the equation, and make calculations using the equation.	 McGraw-Hill Course 1, Chapter 8 Illuminations <u>Talk or Text</u> In this lesson, students compare different costs associated with two cell phone plans, write equations with two variables, and graph the equations. CPalms <u>From Tables to Graphs and Back!</u> Students will match corresponding sets of tables, graphs and linear equations in order to deepen their understanding of multiple representations of the relationships between dependent and independent variables. <u>The Speeding Ticket (Part 1)</u> Students will use real-world application to create and solve linear equations and tables with two variables numerically, verbally, and algebraically. <u>The Speeding Ticket (Part 2)</u> This lesson allows the student to learn about dependent and independent variables and how to make the connection between the linear equation, a linear function, and its graph. MARS/Shell <u>Modeling: Car Skid Marks</u> This lesson is intended to help students use variables to represent quantities and analyze the relationship between these variables using

Grade 6 Math, Adv	Unit 9: Statistical Measu		Projected Time Allotment: 6 Davs	
Sta	indards/Learning Goals:	Co	ontent Limits,	Assessment Types, Calculator
MAFS.6.SP.1.1 Recognize a variability in the data relat the answers. For example, question, but "How old are question because one anti-	a statistical question as one that anticipates ed to the question and accounts for it in "How old am I?" is not a statistical the students in my school?" is a statistical cipates variability in students' ages.	• Calcu •	N/A Jlator: NO Multiple Choice Multiselect	2
MAFS.6.SP.1.3 Recognize a data set summarizes all of measure of variation descu number.	that a measure of center for a numerical its values with a single number, while a ibes how its values vary with a single	• Calcu •	Numbers in iter Data sets in iter Jator: NO Equation Editor Multiple Choice Multiselect	ms must be rational numbers. ms must be numerical data sets. r
MAFS.6.SP.2.5 Summarized context, such as by: b. Describing the nation including how it w c. Giving quantitative and variability (intideviation), as well striking deviations the context in white d. Relating the choice the shape of the d	numerical data sets in relation to their ure of the attribute under investigation, as measured and its units of measurement. e measures of center (median and/or mean) erquartile range and/or mean absolute as describing any overall pattern and any from the overall pattern with reference to ch the data were gathered. e of measures of center and variability to ata distribution and the context in which	Calcu	Numbers in iter Displays should plots, or histog ulator: NO Equation Editor GRID Multiple Choice Multiselect	ms must be rational numbers. I include only dot/line plots, box rams.

MAFS.6.SP.1.1

- Students can describe variability in statistical questions and write meaningful statistical questions.
- Students can recognize that a statistical question is one that anticipates variability in the data related to the question.

Instructional Resources					
Mathematics Formative Assessments (MFAS)	Lesson Resources				
Questions About a Class Students are asked to determine whether or not questions are statistical and justify their responses. TV Statistics Students are asked to write a statistical question and explain why it is statistical. Illustrative Mathematics Assessment Tasks Identifying Statistical Questions Help students learn to distinguish between statistical questions and questions that are not statistical. Buttons: Statistical Questions Provide questions related to a particular context (a jar of buttons) so that students can identify which are statistical questions. Also provides students with an opportunity to write a statistical question that pertains to the context. Statistical Questions Promote a discussion of what makes a statistical question.	 McGraw-Hill Course 1, Chapter 11 CPalms What is a Question? Students will learn how to recognize and formulate a statistical question. After a statistical question is established, students will engage in collecting data from their classmates. <u>Survey Says</u> Lesson addresses statistical and non-statistical questions. The hook will be getting the students talking about what is exciting about the show "The Family Feud" and how the questions on the show are examples of statistical questions because they yield numerical answers that vary from one individual to another. <u>Statistical Question Sort</u> Students will explore statistical questions. Students will be able to create 				
	statistical questions and understand when a question is non-statistical.				

MAFS.6.SP.1.3

- Students can recognize that a measure of center for a numerical data set summarizes all of its values with a single number.
- Students can recognize that a measure of variation describes how its values vary with a single number.

Instructional Resources Mathematics Formative Assessments (MFAS) Lesson Resources Explain Measures of Center Students are asked to list measures of McGraw-Hill • center and explain what they indicate about a set of data. o Course 1, Chapter 11 Explain Measures of Variability Students are asked to list **CPalms** . measures of variability and explain what they indicate about a set of data. Data Detectives Students will become "Data 0 Compare Measures of Center and Variability Students are Detectives" as they investigate that a measure for the asked to explain the difference between measures of center and measures center of a numerical data set summarizes all of its values of variability. with a single number, while a measure of variation describes how its values vary with a single number. Universal GPA This lesson incorporates examples that 0 are relevant to students' interests and uses diverse methods of presentation to demonstrate how changes in measures of variation can affect the measure of central tendency. Play Like you "MEAN" It! Students will investigate \cap how a measure of center, the mean, summarizes a numerical data set of all the values with a single number.

Learning Targets/Foundational Knowledge

MAFS.6.SP.2.5

- Students can summarize numerical data sets in relation to the context in which the data was gathered.
- Students can describe the nature of the attributes under investigations in a data set.
- Students can understand that the measures of center and variability are related to the shape of the data distribution.

Instructional Resources					
Mathematics Formative Assessments (MFAS)	Lesson Resources				
Quiz Mean and Deviation Students are asked to calculate measures of center and variability, identify outliers, and interpret the meaning of each in context. Florida Lakes Students are asked to interpret a histogram by describing the variable under investigation and the number of observations. Select the Better Measure Students are asked to select the better measure of center and variability for each of two distributions of the data. Analyzing Physical Activity Students are asked to calculate measures of center and variability, identify outliers, and interpret the meaning of each in context. Illustrative Mathematics Assessment Tasks Puzzle Times Assess students' ability to construct a dot plot and to calculate and compare measures of center. Average Number of Siblings Compare the mean and median in a context where the data is slightly skewed to the right. Comparing Test Scores Critically compare the center and spread of two data sets. Math Homework Problems Calculate and interpret the Mean Absolute Deviation in a context. Electoral College Help students understand that a distribution can be described in terms of shape and center, and also to provide practice in selecting and calculating measures of center.	 McGraw-Hill Course 1, Chapter 11 Illuminations <u>Why is California So Important?</u> Students learn about the mechanics of the Electoral College and use data on population and electoral votes for each state. CPalms <u>Eat Your Veggies: Alphabet Soup</u> Students will participate in a human box plot and then determine the mean, mode, median, and range of the data set. <u>Exploring Central Tendency</u> Student will work in small groups to apply central tendency to a real world scenario to finally answer the age old question of "when will I ever use this." 				

mean and median for summarizing a given data set.

Grade 6 Math, Adv	de 6 Math, Adv Unit 10: Statistical Displays			
Stellester 2	andards/Learning Goals:	Content Limits,	Assessment Types, Calculator	
MAFS.6.SP.1.2 Understan statistical question has a c	d that a set of data collected to answer a listribution which can be described by its	 Numbers in iter Dot/line plots, lallowed. 	ns must be rational numbers. histograms, and box plots are	
center, spread, and overa	l shape.	Calculator: NO		
		GRIDMultiple ChoiceMultiselect		
MAFS.6.SP.2.4 Display nu including dot plots, histog	merical data in plots on a number line, rams, and box plots.	 Numbers in iter Displays should plots, or histogr 	ns must be rational numbers. include only dot/line plots, box rams.	
		Calculator: NO GRID Multiple Choice	2	
MAFS.6.SP.2.5 Summarize context, such as by:	e numerical data sets in relation to their	 Numbers in iter Displays should plots or bistory 	ns must be rational numbers. include only dot/line plots, box	
a. Reporting the nur	nber of observations.	Calculator: NO		
 b. Describing the national including how it w c. Giving quantitativ and variability (integrational integrational integrationa integrational integratinal integrational integrational integr	cure of the attribute under investigation, vas measured and its units of measurement. e measures of center (median and/or mean) erquartile range and/or mean absolute	 Equation Editor GRID Multiple Choice Multiselect 	2	
deviation), as well striking deviations the context in whi d. Relating the choic the shape of the c the data were gat	as describing any overall pattern and any from the overall pattern with reference to ch the data were gathered. e of measures of center and variability to lata distribution and the context in which hered.			

MAFS.6.SP.1.2

• Students will examine the distribution of a data set and discuss the center, spread and overall shape.

Instructional Resources					
Mathematics Formative Assessments (MFAS)	Lesson Resources				
Pet Frequency given in raw form.Math Test Center distributions of data given in dot plot format.Math Test Spread distributions of data given in dot plot format.Math Test Spread distributions of data given in dot plot format.Math Test Spread distributions of data given in dot plot format.Math Test Shape distributions of data given in dot plot format.Math Test Shape distributions of data given in dot plot format.	 McGraw-Hill Course 1, Chapter 12 Illuminations Exploring Mean and Median Using Box Plots Using an interactive applet, students can compare and contrast properties of measures of central tendency, specifically the influence of changes in data values on the mean and median. 				
Illustrative Mathematics Assessment Tasks Electoral College Help students understand that a distribution can be described in terms of shape and center, and also to provide practice in selecting and calculating measures of center. Average Number of Siblings Compare the mean and median in a context where the data is slightly skewed to the right.	 CPalms <u>Statistically Speaking Part I: An</u> <u>Investigation of Statistical Questions and</u> <u>Data Distribution</u> Through cooperative learning activities, the students will develop an understanding of how to analyze the data collected to answer a statistical question. <u>Statistically Speaking Part II: An</u> <u>Investigation of Statistical Questions and</u> 				

		Data Distribution This lesson focuses on math concepts related to identifying clusters, gaps, outliers and overall shape of a line plot, it will help students build a strong foundation for future concepts in the statistics and probability domain.
	0	<u>Puppy Weights</u> Using the information provided, create an appropriate graphical display and answer the questions regarding shape, center and variability.
•	MARS/	Shell
	0	Mean, Median, Mode and Range Use a
		frequency chart to describe a possible data set, given information on the mean, median, mode, and range.

Learning Targets/Foundational Knowledge					
MAFS.6.SP.2.4					
• Students will examine the distribution of a data set through dot plots, histograms, and box plots.					
Instructiona	l Res	sources			
Mathematics Formative Assessments (MFAS)			Lesson Resources		
Shark Attack Data Students are asked to construct a box plot	McGraw-Hill				
corresponding to a given set of data.		0	Course 1, Chapter 12		
Chores Data Students are asked to display numerical data on a dot plot.	٠	Illumina	ations		
BasketDall Histogram Students are asked to construct a histogram		0	Where is Everybody? Using two online activities		
Illustrative Mathematics Assessment Tasks			(State Data Map and Canada Data Map), students use ratios and percents to compare population density and explore		
Duzzlo Timos Assess students' ability to construct a dat plat and to		0	various statistical measures.		
<u>Puzzle IIIIes</u> Assess students ability to construct a dot plot and to calculate and compare measures of center.		0	Distrig INDA Statistics for BOX and Whisker		
Average Number of Siblings Compare the mean and median in a			make and compare box and whisker plots.		
context where the data is slightly skewed to the right.	•	CPalms			
Comparing Test Scores Critically compare the center and spread of		0	Hista what, hista who Students begin by creating a		
two data sets.			Venn diagram to compare/contrast bar graphs and histograms.		
		0	Box Plots are Easy!! Hands-on activity that		
			introduces students to the concepts of number summaries,		
		0	Dot Plots and Histograms Students will be		
		Ū	exploring numeric displays including dot plots and		
			histogram.		
		0	<u>Plotting Our Scores</u> Students will create two box plots on the same number line and interpret the data.		
		0	<u>Histogram (Virtual Manipulative)</u> In this activity, students can create and view a histogram using existing data sets or original data entered.		
		0	Bar Chart (Virtual Manipulative) This virtual		
			manipulative is intended to introduce users to the idea of visual representation of data by means of a bar chart.		
		0	Box Plotter (Virtual Manipulative) Users select		
		_	a data set or enter their own data to generate a box plot.		
		0	HISTOGRAM VS. BOX PIOT (VIRTUAL		
			<u>IVIANIPUIATIVE</u> This simulation allows the student to		
			and toggle between the two displays.		

 MAFS.6.SP.2.5 (Repeated from Unit 9) Students can summarize numerical data sets in relation to the context in which the data was gathered. Students can report the number of observations in a data set. Students can describe the nature of the attributes under investigations in a data set. Students can understand that the measures of center and variability are related to the shape of the data distribution. Instructional Resources Mathematics Formative Assessments (MFAS) Quiz Mean and Deviation Students are asked to calculate measures of center and variability, identify outliers, and interpret the meaning of each in context. Florida Lakes Students are asked to interpret a histogram by describing the variable under investigation and the number of observations. Select the Better Measure Students are asked to calculate measures of center and variability for each of two distributions of the data. Analyzing Physical Activity Students are asked to calculate measures of center. Buzzle Times Asses students' ability to construct a dot plot and to calculate and compare measures of center. S.P Average Number of Siblings Compare the center and spread of two data sets. Math Homework Problems Calculate and interpret the Mean Absolute Deviation in a context. Electoral College Help students understand that a distribution can be Math Homework Problems Calculate and interpret the Mean Absolute Deviation in a context. Electoral College Help students understand that a distribution can be	Learning Targets/F	oundational Knowledge			
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 Students can describe the nature of the attributes under investigations in a data set. Students can understand that the measures of center and variability are related to the shape of the data distribution. Instructional Resources Mathematics Formative Assessments (MFAS) Quiz Mean and Deviation Students are asked to calculate measures of center and variability, identify outliers, and interpret the meaning of each in context. Florida Lakes Students are asked to interpret a histogram by describing the variable under investigation and the number of observations. Select the Better Measure Students are asked to select the better measure of center and variability, identify outliers, and interpret the meaning of each in context. Illustrative Mathematics Assessment Tasks Puzzle Times Assess students' ability to construct a dot plot and to calculate and compare measures of center. 6.SP Average Number of Siblings Compare the mean and median in a context. Butzle Times Assess students' ability skewed to the right. Comparing Test Scores Critically compare the center and spread of two data sets. Math Homework Problems Calculate and interpret the Mean Absolute Deviation in a context. Electoral College Help students understand that a distribution can be Nath Homework Problems Calculate and interpret the Mean Absolute Deviation in a context. Electoral College Help students understand that a distribution can be	• Students can report the number of observations	in a data set.			
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Absolute Deviation in a context. <u>Electoral College</u> Help students understand that a distribution can be	Math Homework Problems Calculate and interpret the Mean				
Electoral College Help students understand that a distribution can be	Absolute Deviation in a context.				
	Electoral College Help students understand that a distribution can be				
described in terms of shape and center, and also to provide practice in selecting and calculating measures of center.	described in terms of shape and center, and also to provide practice in selecting and calculating measures of center				
Mean or Median? Examine advantages and disadvantages of the	Mean or Median? Examine advantages and disadvantages of the				
mean and median for summarizing a given data set.	mean and median for summarizing a given data set.				

Grade 6 Math, Adv	Unit 11: Area		Projected Time
Semester 2	ndards/Loarning Coals	Contont Limits	Anothem. O Days
MAFS.6.G.1.1 Find the are quadrilaterals, and polygo decomposing into triangle in the context of solving re	and a of right triangles, other triangles, special ns by composing into rectangles or s and other shapes; apply these techniques eal-world and mathematical problems.	 Numbers in iter numbers. Limit shapes to composed into Calculator: NO Equation Editor GRID Multiselect Open Response 	those that can be decomposed or rectangles and/or right triangles.
MAFS.6.G.1.3 Draw polyge coordinates for the vertice side joining points with th coordinate. Apply these te world and mathematical p	ons in the coordinate plane given es; use coordinates to find the length of a e same first coordinate or the same second echniques in the context of solving real- roblems.	 Numbers on ite Items may use a When finding sitraditional oriento axes). Calculator: NO Equation Editor Grid Multiple Choice 	ms must be rational numbers. all four quadrants. ide length, limit polygons to ntation (side lengths perpendicular
MAFS.6.NS.3.8 Solve real- graphing points in all four use of coordinates and ab points with the same first ASSESSED WITH: MAFS.6.1	world and mathematical problems by quadrants of the coordinate plane. Include solute value to find distances between coordinate or the same second coordinate.	 Plotting of poin include some nu quadrant). Numbers in iter rational numbe Do not use poly Do not exceed a scales can vary. Calculator: NO Equation Editor GRID Matching Item Multiple Choice Multiple ctoice 	ts in the coordinate plane should egative values (not just first ms must be positive or negative rs. gons/vertices. a 10x10 coordinate grid, though

MAFS.6.G.1.1

- Students can find the area of right triangles and other triangles by composing into rectangles or decomposing into triangles and other shapes.
- Students can find the area of special quadrilaterals and polygons by composing into rectangles or decomposing into triangles and other shapes.
- Students can apply these techniques in the context of solving real-world and mathematical problems.

Instructional Resources				
Mathematics Formative Assessments (MFAS)		Lesson Resources		
Swimming Pool Walkway Solve a problem involving finding the area of a composite plane figure.	• [VcGraw-Hill o Course 1, Chapter 9		
Lost Key Find the square feet of a garden by composing or decomposing the composite figure into rectangles.	•	Iluminations		
Area of Quadrilaterals Find the area of a trapezoid and a parallelogram by composing or decomposing into triangles and rectangles.		Students develop the area formula for a triangle. Students find the area of rectangles and squares and compare them		
<u>Area of Kite</u> Find the area of a kite by composing it into rectangles or decomposing it into triangles.		to the areas of triangles derived from the original shape.		
<u>Area of Triangles</u> Find the area of two different triangles.		will use their knowledge of rectangles to discover the area		
Illustrative Mathematics Assessment Tasks	• (Palms		
Same Base and Height, Variation 1 Find the areas of triangles		0 Area of a Triangle Students will derive the area		

Same Base and Height, Variation 2 Find the area of triangles that have the same base and height (second variation/ more abstract). Finding Areas of Polygons Students work on a sequence of area problems that shows the advantage of increasingly abstract strategies in preparation for developing general area formulas for parallelograms and triangles. Base and Height Students understand what is meant by a base and its corresponding height in a triangle and to be able to correctly identify all three base-height pairs.	 formula for a triangle using the relationship between a rectangle and triangle. Students will be able to apply the area formula to find the area of a triangle. Area of a Right Triangle Students will compose triangles into rectangles and decompose rectangles into triangles to determine their areas, and justify and find relationships among the formulas for the areas of different polygons . Enrique's Ruined Carpet Students use an apartment layout to find the area of carpeted floor by
triangles. <u>Base and Height</u> Students understand what is meant by a base and its corresponding height in a triangle and to be able to correctly identify all three base-height pairs.	 relationships among the formulas for the areas of different polygons . <u>Enrique's Ruined Carpet</u> Students use an apartment layout to find the area of carpeted floor by decomposing complex shapes into rectangles and triangles.

MAFS.6.G.1.3

- Students can draw polygons in the coordinate plane give coordinates for the vertices
- Students can use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate.

Instructional Resources

• Students can apply these techniques in the context of solving real-world and mathematical problems.

<u>Mathematics Formative Assessments (MFAS)</u>
Polygon Grid Draw a polygon given the coordinates of its vertices and
determine the length of the polygon's diagonals

Polygon Coordinates Draw a polygon given the coordinates of its vertices and determine both the lengths of sides and if any sides are parallel. Fence Length Draw a polygon given the coordinates of its vertices and determine the perimeter of the polygon in a real-world context.

<u>Patio Area</u> Draw a polygon given the coordinates of its vertices and determine the area of the polygon in a real-world context.

Illustrative Mathematics Assessment Tasks

Polygons in the Coordinate Plane Students practice plotting points in the coordinate plane and finding the areas of polygons. Walking the Block Students apply the calculation of distances on a coordinate plane to a real life context.

Lesson Resources

- McGraw-Hill
 - o Course 1, Chapter 9

Illuminations

 Finding Your Way Around dimensional space via an activity in which they navigate the coordinate plane.

CPalms

- <u>Plotting Polygons</u> Students are challenged to plot coordinates on a graph, in order to create a mystery polygon, and find the length of its horizontal and vertical sides using the coordinates.
- Plotting Polygons with GeoGebra Guide students through the process of graphing polygons on the coordinate plane and finding vertical and horizontal side lengths.
- O Profit Plaza Students use mathematical data and logic/reasoning to place vendors into retail spaces in a shopping plaza. They are also required to find the area of each space and calculate the total leasing charges. The plans for the plaza are given on a coordinate plane, so students will need to find the lengths of horizontal and vertical line segments (using the coordinates of the endpoints) to calculate the areas of the rectangular and composite spaces.
- o <u>The Mystery of Crop Circles...on a</u>
 - <u>coordinate plane</u> Students will use their knowledge of plotting points on quadrant I of the coordinate plane to figure out other coordinate pairs within quadrants II, III, and IV. Students are challenged to match description cards to the matching "map" (four-coordinate grid). Students will draw their own polygons on the four-coordinate grid and provide the coordinates for each.
- What Is Your Point? In this game, a student challenges a partner to recreate his or her quadrilateral or other shape on a geoboard by calling out the ordered pairs of the quadrilateral's vertices.

MARS/Shell

o Using Coordinates to Interpret and

Represent Data Students work in the coordinate plane
to solve a problem in a real-world context. Students
measure and interpret horizontal or vertical intervals on
graphs.

MAFS.6.NS.3.8

- Students can solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane.
- Students can use coordinates to find distances between points with the same first coordinate or the same second coordinate.
- Students can use absolute value to find distances between points with the same first coordinate or the same second coordinate.

Instructiona	al Res	sources
Mathematics Formative Assessments (MFAS)		Lesson Resources
Garden Coordinates Students are given the coordinates of the	٠	McGraw-Hill
vertices of a rectangle and are asked to graph the rectangle and find its		o Course 1, Chapter 9
perimeter.	•	CPalms
Bike Lot Coordinate Students are asked to graph two points given		 <u>Coordinate Grids: The Key to the City -</u>
their coordinates and to find the coordinates of two other points so that the		solving real world problems using the
four points represent the vertices of a square.		coordinate grid In this lesson students use previous
Garden Area Students are given coordinates of three vertices of a		knowledge of graphing in a 4 quadrant coordinate grid and
rectangle and asked to determine the fourth vertex and the area of the		individually solve a real world problem involving finding
rectangle.		distance on a coordinate grid.
Determine the Distance Students are given the coordinates of three	•	MARS/Shell
points (with the same x- or y-coordinate) and asked to determine the		 <u>A Measure of Slope</u> This lesson unit assesses
distance between pairs of points without graphing.		students' understanding of the four quadrants of the
		understanding of slone
Illustrative Mathematics Assessment Tasks		
Distances Between Points Students solve mathematical problems		
using points in the coordinate plane.		

Grade 6 Math, Adv	Unit 12: Volume and Surface	Unit 12: Volume and Surface Area			
Semester 2				Allotment: 8 Days	
Sta	ndards/Learning Goals:	Co	ontent Limits,	Assessment Types, Calculator	
MAFS.6.G.1.2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the		•	 Prisms in items must be right rectangular prisms. Unit fractional edge lengths for the unit cubes used for packing must have a numerator of 1. 		
the same as would be four prism. Apply the formulas rectangular prisms with fra solving real-world and mat	by multiplying the edge lengths of the $V=lwm$ and $V=bh$ to find volumes of right ctional edge lengths in the context of hematical problems.	• •	Equation Editor GRID	r	
MAFS.6.G.1.4 Represent the up of rectangles and triangles area of these figures. Apple real-world and mathematic	nree-dimensional figures using nets made gles, and use the nets to find the surface y these techniques in the context of solving cal problems.	•	Numbers in iter numbers. 3D figures are l triangular prisn triangular pyrar	ms must be positive rational imited to rectangular prisms, ns, rectangular pyramids, and mids.	
		Calcu	lator: NO		
		• • • •	Equation Editor GRID Matching Item Multiple Choice Multiselect	2	

MAFS.6.G.1.2

- Students can find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths and show that the volume is the same as would be found by multiplying the edge lengths of the prism.
- Students can apply the formulas *V*= *lwh* and *V*= *bh* to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

Mathematics Formative Assessments (MFAS)	Lesson Resources		
Prism Packing Students are asked to determine the number of unit prisms needed to fill a larger prism with fractional dimensions. Clay Blocks Students are asked to calculate and explain the relationship between two approaches to finding the volume of a right rectangular prism. Moving Truck Students are asked to determine the volume of a right rectangular prism (truck) given fractional edge lengths.	 McGraw-Hill Course 1, Chapter 10 Illuminations <u>Finding surface Area and Volume</u> Students use the isometric drawing tool to explore volume and surface area. 		
<u>Bricks</u> Students are asked to determine the volume of a right rectangular prism given fractional edge lengths.	CPalms		
Illustrative Mathematics Assessment Tasks Computing Volume Progression 1 Students explore the relationship between the side-lengths of a cube and its volume. Computing Volume Progression 2 Students are asked to calculate volume through a real word multi-step problem. Computing Volume Progression 3 Students are given the volume and are asked to find the height. Computing Volume Progression 4 This tasks builds on a more abstract understanding of volume. This problem is based on Archimedes' Principle that the volume of an immersed object is equivalent to the volume of the displaced water. Banana Bread Provides students with a multi-step problem involving volume and discuss the difference between exact calculations and their meaning in a context.	 C <u>FIII TO BEIIEVE</u> Students work cooperatively to find the volume of a right rectangular prism, using whole and fraction units of measurement, using the volume formula, and using manipulatives to count the number of units necessary to fill the prisms, and compare it with the formula results. O <u>How Many Rubik's Cubes Can You Pack?</u> A hands-on problem solving approach to find the volume of a right rectangular prism with fractional edges. Students design boxes and fill with Rubik's Cubes, create a formula from the patterns they found and apply fractional units to their formula. O <u>How Much Can It Hold?</u> The students will utilize math cubes as they construct and analyze the relationship between the length, width, and height to the total amount of cubes. They will be able to apply it to real world applications of other right rectangular prisms and compare to determine which will hold the most volume. 		

	0	How Many Small Boxes? Students will extend their knowledge of volume from using whole numbers to using fractional units. Students will work with adding, multiplying, and dividing fractions to find the volume of right rectangular prisms, as well as, determining the number of fractional unit cubes in a rectangular prism.
	0	<u>Sound Is Not the Only Place You Hear</u> <u>About Volume!</u> Students will design their own data collection and organizing the data that they collect. They will apply the skill of finding volume to using fractional parts of a number (decimals) and finding the product using the volume formula.
•	MARS/S	Shell
	0	Optimizing: Packing It In Students Use mathematics to model a real world scenario concerning volume.
•	LearnZi	llion
	0	Finding the volume of a right rectangular prism with fractional edge lengths A set of two videos that show how to find the volume of a rectangular prism by filling it with unit cubes and by developing a formula
•	Shodor	
	0	Volume of Prisms Interactive lesson designed to introduce the concept of finding volume of a rectangular prism.

MAFS.6.G.1.4

- Students can represent three-dimensional figures using nets made up of rectangles and triangles.
- Students can use the nets made up of rectangles and triangles to find the surface area of threedimensional figures.
- Students can apply these techniques in the context of solving real-world and mathematical problems.

instructional Resources				
Mathematics Formative Assessments (MFAS)	Lesson Resources			
Skateboard Ramp Given a real world context, students are asked to draw a net of a three-dimensional figure (triangular prism). Pyramid Project Given a real world context, students are asked to draw a net of a three-dimensional figure (square pyramid). Windy Pyramid Given a real world context, students are asked to use a net to find the surface area of a triangular pyramid. Rust Protection Given a real world context, students are asked to use a net to find the surface area of a rectangular prism. Illustrative Mathematics Assessment Tasks Nets for Pyramid and Prisms Students work with nets for three- dimensional shapes and use them to calculate surface area.	 McGraw-Hill Course 1, Chapter 10 Illuminations <u>Building a Box</u> Students will create, compare and describe different two-dimensional nets that can be folded into a three-dimensional cube and examine the properties of the nets and resulting cubes, including surface area. <u>Finding Surface Area and Volume</u> Students use the isometric drawing tool to explore volume and surface area. CPalms <u>Box It Up, Wrap It Up (Surface Area of Destangeular Prismed) on the results of the results area.</u> 			
	 <u>Rectangular Prisms</u>) Students will make connections between area of two dimensional figures and calculating the surface area of rectangular prisms using nets, within the context of wrapping birthday presents. <u>Formula Detective: Finding the Surface</u> <u>Area of a 3D Figure</u> Students derive the formulas for 3D figures by building models for nets. 			

	0	How Much Paint Will It Take? Students create
		right rectangular and triangular prisms and problem-solve
		how to find the flat 2-dimensional surface area.
	0	Surface Area of Prisms and Pyramids Students
		will use nets made up of rectangles and triangles to
		calculate the surface area of rectangular prisms, triangular
		prisms, and square pyramids.
	0	What's on the Surface? Students evaluate the
		measurements of shapes that form three-dimensional composite shapes to compute the surface area.
	0	Wrapping Up Geometry (1 of 3)
	0	Wrapping Up Geometry (2 of 3)
	0	Wrapping Up Geometry (3 of 3) A series of 3
		Lessons on Understanding and Finding the surface area of
		rectangular and triangular prisms.
•	MARS/	Shell
	0	Designing: Candy Cartons Students are given a
		real world problem of designing a candy carton involving capacity and surface area.
•	LearnZ	illion
	0	Use nets to represent 3D figures and find
		<u>Surface area</u> A series of videos for representing three- dimensional figures using nets and finding surface area of
		three-dimensional figures made up of rectangles and triangles.
	0	Show 3D figures as being composed of
		rectangles and triangles; find surface area A
		series of videos that show three-dimensional figures as
		being composed of rectangles and triangles; find surface
		area.

Grade 6 Math, Adv	Unit 13: Ratios and Proportional	Reas	oning	Projected Time
Semester 2				Allotment: 10 Days
St	andards/Learning Goals:	Con	ntent Limits,	Calculator, Assessment Types
MAFS.7.RP.1.1 Compute including ratios of lengths or different units.	unit rates associated with ratios of fractions, , area and other quantities measured in like	 N it w fr a R W U Q Q Q Calcula E G G M M O C 	Numbers in iter tems may inclu vhole number rom this stand is fractions. Ratios may be e vith words. Jnits may be th quantities. ator: YES Equation Editor GRID Multiple Choice Multiselect Dpen Response Table Item	ms must be rational numbers. Some ide one rational number and one (less than 1), but the bulk of items ard should involve ratios expressed expressed as fractions, with ":" or the same or different across the two
MAFS.7.RP.1.2 Recognize	and represent proportional relationships	• N	Numbers in iter	ns must be rational numbers.
between quantities. a. Decide whether to relationship, e.g.,	wo quantities are in a proportional by testing for equivalent ratios in a table or	 R W U q 	Ratios should b vith words. Jnits may be th quantities.	e expressed as fractions, with ":" or the same or different across the two
graphing on a coo	rdinate plane and observing whether the	Calcula	ator: YES	
graphing on a coo graph is a straight b. Identify the const graphs, equations proportional relat c. Represent propor <i>example, if total c</i> <i>items purchased c</i> <i>between the total</i> <i>expressed as t = j</i> d. Explain what a po relationship mear attention to the p <u>MAFS.7.RP.1.3</u> Use propo and percent problems. <i>Ex</i>	rdinate plane and observing whether the line through the origin. ant of proportionality (unit rate) in tables, , diagrams, and verbal descriptions of ionships. tional relationships by equations. For ost t is proportional to the number n of at a constant price p, the relationship cost and the number of items can be pn. int (x, y) on the graph of a proportional as in terms of the situation, with special oints $(0, 0)$ and $(1, r)$ were r is the unit rate. rtional relationships to solve multistep ratio amples: simple interest, tax, markups and	 E G M M O T 	Aumbers in iter	ns must be rational numbers. ne same or different across the two
markdowns, gratuities an	d commissions, fees, percent increase and	Q Calcula	ator: VFS	
decrease, percent error.		 E G M M M O T 	quation Editor GRID Matching Item Multiple Choice Multiselect Dpen Response Table Item	2
MAFS.7.NS.1.3 Solve real- the four operations with r	world and mathematical problems involving ational numbers.	 N C fr d Calcula E M N 	Numbers in iter Complex fractic ractions with s Jenominators. ator: NEUTRAL Equation Editor Multiple Choice Multiselect	ns must be rational numbers. ons can be used, but should contain ingle-digit numerators and
		• 1	able item	

MAFS.7.RP.1.1

• Students can compute unit rates.

• Students can compute unit rates with fractions			
 Students can compute unit rates with measurem 	ents	, like len	gths, area, volume or other units.
Instruction	Inal Resources		
Formative Assessments			Lesson Resources and Activities
Mathematics Formative Assessments (MFAS)	•	McGrav	w-Hill
Unit Rate Area Convert this ratio to a unit rate and explain what this		0	Course 2, Chapter 1
Computing Unit Pates Write two unit rates and evolving what each	•	Illumin	ations
unit rate means in the context of the problem.		0	Highway Robbery Students apply their knowledge of
Comparing Unit Rates Express a rate as a unit rate in gallons per			ratios, unit rates, and proportions to sort through the clues and deduce which suspect is the true culorit
hour and determine which is faster.		0	What's Your Rate Write and solve proportions by
Unit Rate Length Show how you converted this ratio to a unit rate.		-	gathering data and calculating unit rates.
	٠	CPalms	i de la construcción de la constru
Illustrative Mathematics Assessment Tasks		0	The Price is Right In this lesson, students practice
<u>Cider versus Juice-Variation 1</u> Write and compare unit rates.			finding the unit price of pre-selected items from local
<u>Cider versus Juice-Variation 2</u> Apply proportional reasoning to			grocery store ads to decide which store has the best prices. (from Beacon Learning Center)
Cooking with the Whole Cup Use a regime to find unit rates for		0	Let's Rate It The purpose of this lesson is to introduce
many different pair-wise ratios.			rates of change to students, allowing them to explore how
Molly's Run Context involving constant speed provides a transition from			rates are formed, what rates are used for, and how rates
working with ratios involving whole numbers to ratios involving fractions.		Brain P	
Molly's Run-Assessment Variation This task is part of three	•		Ratio Rumble Game and Lesson Identify ratio
assessment tasks that address various aspects of 6.RP domain and help distinguish between 6^{th} and 7^{th} grade expectations		0	when used in a variety of contextual situations and explain
Track Practice Ask students to find the unit rates that one can compute			why ratios and rates naturally relate to fractions and
in this context with same and different units.			decimals.
	•	Yummy	/ Math
		0	Which Sweethearts are the Best Deal?
			methods or through tables or graphs to prove
			reasoning. Create a deal that is not the best or worst deal
			comparatively.
		0	HOW MUCH Cattelne? Comparing caffeine content of
		Videos	various armas in graphic displays and tables.
	-		Unit Rates Short video clip defining unit rate
		0	Unit Rates Shmoon video on unit rates (may require
		0	free account)

MAFS.7.RP.1.2

- Students can identify a proportional relationship in a table.
- Students can identify a proportional relationship on a coordinate plane.
- Students can identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions.
- Students can explain what a point on the graph of a proportional relationship means within the context of the situation. Students can explain what the constant of proportionality means within the context of the problem.
- Students can write equations to represent proportional relationships.

Formative Assessments	Lesson Resources and Activities		
Mathematics Formative Assessments (MFAS)	McGraw-Hill		
Teacher to Student Ratios Graph four ordered pairs given in	 Course 2, Chapter 1 		
context and decide if the variables they represent are proportionally related.	Yummy Math		
Constant of Proportionality Trip Identify and explain the	• Should I Buy the Big One? Decide if the BIG one is		
constant of proportionality given a verbal description and a diagram	a fair deal		
representing a proportional relationship.	• Cheesy Goldfish Crackers The activity compares		
Finding Constant of Proportionality Determine the constant of	products and asks which one is the best deal.		
the problem.	 Dog Years Read tables and graphs, describe relationships 		
Deciding if Proportional Decide if two variables are proportionally	between variables and consider proportionality.		
related based on data given in a table.	CPalms		
Writing an Equation Write an equation to represent a proportional	 Are Corresponding Leaf Veins Proportional 		
relationship depicted in a graph.	to Leaf Heights Measure and graph leaves and vein		
Identify Constant of Proportionality in Equations Identify and	lengths to determine proportionality.		
explain the constant of proportionality in three different equations.	 How Does It Compare? Identify whether a 		
Graphs of Proportional Relationships Identify the graph of a	statement shows proportionality or is simply two non-		
Babysitting Graph Given a graph that models the hourly earnings	proportional ratios.		
interpret ordered pairs in context.	MARS/Shell		
Serving Size Write an equation for the size of the serving and the number	 <u>Proportion and Non-Proportion Situations</u> 		
of calories.	Identify when two quantities are proportional or not. Solve		
	proportionality problems.		
Illustrative Mathematics Assessment Tasks	 Modeling: A Kace Recognize and use proportional relationships 		
Art Class, Assessment Variation Decide proportional relationship	Puscos Task Warks with a distance time much		
using a table, find a unit rate using non-whole numbers, and represent with	describing a bus journey		
an equation.	descholing a bas journey.		
Buying Bananas-Assessment version Find a unit rate for a ratio of			
Buying Coffee Find a unit rate in a context and to draw the graph			
Bobot Baces Identify the points on a distance vs. time graph within			
context.			
Robot Races, Assessment Variation Explain the meaning of a point			
on the graph and compute and compare unit rates with fractions.			
Sore Throats-Variation 1 Finding equivalent ratios and proportional			
reasoning.			
Walk-a-thon 2 Translate information in a table (with decimals) and find			
unit distance and distance traveled per unit time. Translate into equations			
and graphs.			
Cruce versus Juice-variation 1 Compare two rates in different units.			
proportionality.			
 proportional relationship. <u>Babysitting Graph</u> Given a graph that models the hourly earnings, interpret ordered pairs in context. <u>Serving Size</u> Write an equation for the size of the serving and the number of calories. <u>Illustrative Mathematics Assessment Tasks</u> <u>Art Class, Assessment Variation</u> Decide proportional relationship using a table, find a unit rate using non-whole numbers, and represent with an equation. <u>Buying Bananas-Assessment Version</u> Find a unit rate for a ratio of non-whole numbers. <u>Buying Coffee</u> Find a unit rate in a context and to draw the graph. <u>Robot Races</u> Identify the points on a distance vs. time graph within context. <u>Sore Throats-Variation 1</u> Finding equivalent ratios and proportional reasoning. <u>Walk-a-thon 2</u> Translate information in a table (with decimals) and find unit distance and distance traveled per unit time. Translate into equations and graphs. <u>Cider versus Juice-Variation 1</u> Compare two rates in different units. <u>Proportionality</u> Make sense out of the definition of direct proportionality. 	 MARS/Shell Proportion and Non-Proportion Situations Identify when two quantities are proportional or not. Solve proportionality problems. Modeling: A Race Recognize and use proportional relationships. Busses Task Works with a distance-time graph describing a bus journey. 		

Learning Targets/Foundational Knowledge			
MAFS.7.RP.1.3			
• Students can solve multistep ratio problems.			
Special Note: Students will solve multistep perce	nt problems in Unit 14.		
Instructional Resources			
Formative Assessments	Lesson Resources and Activities		
Mathematics Formative Assessments (MFAS)	Lesson Resources		
Making Cookies Find values given a set of rational number	McGraw-Hill		
quantities.	 Course 2, Chapter 1 		
	Three Act Math		
Illustrative Mathematics Assessment Tasks	 <u>Dueling Discounts</u> Which coupon should I use? 		
Friends Meeting on Bikes Determine speed based on distance and speed approaching from opposite direction	Yummy Math		
Two-School Dance Calculate the fraction of a combined population	 <u>Cruising</u> Consider how these cruise ships manage their 		
given different ratios for two distinct populations.	resources and calculate per day and per cruise		
	requirements.		
	• WARS/Shell		
	 ICE Cream Task Uses multi-step proportional 		
	cream.		
	 Short Tasks-Ratio and Proportions Uses several 		
	short questions from RP cluster. Most problems are multi-		
	step.		

MAFS.7.NS.1.3

- Students can add, subtract, multiply and divide rational numbers (focus on fractions, mixed numbers, decimals, percents from 6th grade)
- Students can solve real world problems with rational numbers.
- Students can solve mathematical problems with rational numbers.

Special Note: Students will solve operations with positive and negative numbers in Unit 15. Students will go into greater depth with this standard in Units 16 and 17.

Instructional Resources			
Formative Assessments	Lesson Resources and Activities		
Mathematics Formative Assessments (MFAS)	Lesson Resources		
Trail Mix Munchies Calculate using division with fractions and mixed	McGraw-Hill		
numbers	 Course 2, Chapter 1 		
	Illuminations		
	 <u>A Lunch-In Affair</u> Organize and prepare a luncheon 		
	for the entire class.		
	 <u>Classic Middle Grades Problems for the</u> 		
	Classroom Represent and solve ratio problems in		
	several different ways.		
	Brain Pop		
	 Game Up: Lure of the Labyrinth: Employee 		
	Lounge Define the value of a variable based on answers		
	Shmoop – Quiz Activity		
	 Word Problems with Rational Numbers – 		
	Math Shack		

Grade 6 Math, Adv Unit 14: Percents			Projected Time
Semester 2	Semester 2		Allotment: 10 Days
Sta	indards/Learning Goals:	Content Limits,	Assessment Types, Calculator
MAFS.7.RP.1.2 Recognize between quantities. c. Represent proport <i>example, if total co items purchased a between the total</i> <i>expressed as t=pn.</i>	and represent proportional relationships ional relationships by equations. For ost t is proportional to the number n of t a constant price p, the relationship cost and the number of items can be	 Numbers in iter Ratios should b with words. Units may be th quantities. Calculator: YES Equation Editor GRID Matching Item Multiple Choice Multiselect Open Response 	ms must be rational numbers. ne expressed as fractions, with ":" or ne same or different across the two r
MAFS.7.RP.1.3 Use proportion of the proportion of the problems. Exclamate downs. are training and percent problems.	tional relationships to solve multistep ratio imples: simple interest, tax, markups and	 Table Item Numbers in iter Units may be the quantities. 	ms must be rational numbers. ne same or different across the two
markaowns, gratuities and	commissions, jees, percent increase and	Calculator: YES	
decrease, percent error.		 Equation Editor GRID Matching Item Multiple Choice Multiselect Open Response Table Item 	
MAFS.7.EE.1.2 Understand	that rewriting an expression in different	 Numbers in iter including integral 	ms must be rational numbers, ers fractions and decimals
forms in a problem contex	t can shed light on the problem and how	 Expressions mu 	ist be linear.
the quantities in it are rela	ted. For example, $a + 0.05a = 1.05a$	Calculator: NEUTRAL	-
means that "increase by 5	%" is the same as "multiplying by 1.05".	 Equation Editor Multiple Choice Multiselect Open Response 	r 2
MAFS.7.EE.2.3 Solve multi posed with positive and ne	MAFS.7.EE.2.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole		ms must be rational numbers. equire two or more steps.
numbers, fractions, and de	cimals), using tools strategically. Apply	Calculator: YES	
properties of operations to convert between forms as reasonableness of answers strategies. For example: If raise, she will make an add for a new salary of \$27.50. long in the center of a doo place the bar about 9 inche	appropriate; and assess the s using mental computation and estimation a woman making \$25 an hours gets a 10% ditional $\frac{1}{10}$ of her salary an hour, or #2.50, If you want to place a towel bar $9\frac{3}{4}$ inches r that is $27\frac{1}{2}$ inches wide, you will need to es from each edge; this estimate can be	 Equation Editor Multiple Choice Multiselect 	r 2
used as a check on the exa	ct computation.		

MAFS.7.RP.1.2c

• Students can write equations to represent proportional relationships.

Instructional Resources				
ation Identify and onal relationship that , or an equation.				
rtional				
ations to represent				
-				
<u>ation</u> Identif onal relationsi , or an equatic <u>rtional</u> ations to repre				

Learning Targets/Foundational Knowledge

MAFS.7.RP.1.3

several discounts.

- Students can solve multistep proportional relationships.
- Students can solve multistep interest and tax problems
- Students can solve multistep markup and markdown problems.
- Students can solve percent increase, decrease and error problems.
- Students can solve multistep fee, gratuity and commission problems.

Instructional Resources

Mathematics Formative Assessments (MFAS)	Lesson Resources
Finding Fees Complete a multi-step fee percent problem.	McGraw-Hill
Tiffany's Tax Calculate the amount of sales tax and total price, given	 Course 2, Chapter 2
prices of individual items to purchase.	Illuminations
Gasoline Prices Calculate the percent change for gas prices.	 Big Math and Fries This lesson is designed to enlighten on calculating percent of calories from fat
Illustrative Mathematics Assessment Tasks	carbohydrates, and protein.
Anna in D.C. Solve a multi-step percentage problem.	CPalms
Measuring the area of a circle Addresses percent error with	 <u>Pricing the Twelve Days of Christmas</u>
calculating area of a circle.	Determine the current cost of items in the 12 Days of
Lincoln's math problem Solve a multi-step problem involving simple	Christmas song.
interest.	MARS/Shell
Buying Protein Bars and Magazines Solve a multistep problem	 Increasing or Decreasing Quantities by
involving sales tax.	Percents Translating between percents, decimals, and
Chess Club Solve a percent increase in one part with a percent decrease	fractions. Representing percent increase and decrease as
in the remaining. Find the overall percent change.	multiplication. Recognizing the relationship between
Double Discounts Calculate percent decreases in the context of	increases and decreases.

- <u>25% Sale Task</u> Uses multi-step discount problem.
- Ice Cream Task Plan how to sell ice cream at a school event.

Tax and Tip Calculate the tax and tip given the subtotal.

Finding a 10% increase Simple percent increase task.

<u>The Price of Bread</u> Calculate the percent increase and relative cost in a real-world context.

Selling Computers Calculate quantities based on percent increase.

Learning Goals/Fo	oundational Knowledge	
MAFS.7.EE.1.2		
 Students can represent percent problems as mathematical expressions when displayed as verbal expressions, tape diagrams or other representations. Students can recognize and write percents as decimal values (from 6th grade). Students can combine like terms to create equivalent expressions (from 6th grade). 		
Students can recognize it a percent change is an i Instruction	ncrease or decrease within the context of a problem.	
Mathematics Formative Assessments (MFAS) Rectangular Expressions Given equivalent expressions with rational coefficients explain what each expression represents within the context of the problem. Explain Equivalent Expressions Given equivalent expressions with rational coefficients explain what each expression represents within the context of the problem. Illustrative Mathematics Assessment Tasks Ticket to Ride Understand different forms of linear equations. Interpret pieces of an expression by parsing the expression from different algebraic perspectives.	 <u>Lesson Resources</u> McGraw-Hill Course 2, Chapter 2 Illuminations <u>Algebra Tiles</u> Online Algebra manipulative Join the Club: Identifying and Combining <u>Like Terms</u> 3 games that focus on identifying and combining like terms CPalms <u>Equivalent Expressions</u> Identify relationships and utilize prior knowledge of properties to identify equivalent expressions. MARS/Shell Steps to Solving Equations Form and solve linear 	
	 <u>Steps to Solving Equations</u> Form and solve linear equations involving factorizing and using the distributive law. 	

MAFS.7.EE.2.3

- Students can calculate using fractions, decimals and whole numbers in multistep problems.
- Students can calculate multistep discount, percent change, tax/tip, interest and markup/markdown problems.
- Students can use mental math and estimation strategies to assess the reasonableness of a solution.

Grade 6 Math, Adv	Unit 15: Integers	Projected Time	
Semester 2		Allotment: 10 D	Days
Standards/Learning Goals:		Content Limits, Assessment Types, Ca	alculator
MAFS.7.NS.1.1 Apply and extend previous understandings of addition		 Numbers in items must be rational num integers, decimals, and fractions. 	bers: use
and subtraction to add and subtract rational numbers; represent		 Limit decimals to those ending in 0.25, 0).5, and
addition and subtraction on a horizontal and vertical number line		0.75.	
diagram.		Limit fractions to halves and fourths. Calculator: NEUTRAL	
a. Describe situation	s in which opposite quantities combine to	Equation Editor	
make 0. For exam	ole, a hydrogen atom has 0 charge because	• GRID	
its two constituen	ts are oppositely charged.	Multiple Choice Multiselect	
b. Understand <i>p+q</i> a	s the number located a distance $ q $ from p ,	Open Response	
in the positive or i	negative direction depending on whether q		
is positive or nega	tive. Show that a number and its opposite		
have a sum of 0 (a	re additive inverses). Interpret sums of		
rational numbers	by describing real-world contexts.		
c. Understand subtra	action of rational numbers as adding the		
additive inverse, p	-q=p+(-q). Show that the distance between		
two rational numb	pers on the number line is the absolute		
value of their diffe	erence, and apply this principle in real-world		
contexts.			
Apply properties of	of operations as strategies to add and		
subtract rational r	numbers.		
MAFS.7.NS.1.2 Apply and	extend previous understandings of	 Numbers in items must be rational num 7.NS 1.2a, b, c require the incorporation (bers. of a
multiplication and division	and of fractions to multiply and divide	negative value.	014
rational numbers.		Calculator: NO	
a. Understand that r	nultiplication is extended from fractions to	Equation Editor	
rational numbers	by requiring that operations continue to	GRID Matching Item	
satisfy the proper	ties of operations, particularly the	Multiple Choice	
distributive prope	rty, leading to products such as (-1)(-1)=1	Multiselect	
and the rules for r	nultiplying signed numbers. Interpret	lable Item	
products of ration	al numbers by describing real-world		
contexts.			
b. Understand that in	ntegers can be divided, provided that the		
divisor is not zero	and every quotient of integers (with no-		
zero divisor) is a ra	ational number. If p and q are integers, the		
-(p/q)=(-p)/q=p/(-	<i>q)</i> . Interpret quotients of rational numbers		
by describing real	wond contexts.		
Apply properties of operation	cions as strategies to multiply and divide		
rational numbers.		 Numbers in items must be rational num 	hors
the four operations with a	wond and mathematical problems involving	 Complex fractions may be used, but sho 	ould contain
the rour operations with r		fractions with single-digit numerators ar	nd
		denominators. Calculator: NEUTRAL	
		Equation Editor	
		Multiple Choice	
		Multiselect Table the set	
		• Table Item	

MAFS.7.NS.1.1

- Students can describe situations (in context) when opposite quantities combine to make 0.
- Students can recognize additive inverses.
- Students can recognize addition of positive or negative rational numbers (integers in this unit) as the movement in a positive or negative direction.
- Students can calculate using additive inverses.
- Students can interpret the sum of rational numbers (integers in this unit) in context.
- Students can interpret the sum of rational numbers (integers in this unit) on a number line.
- Students can recognize that subtraction can be written as adding the additive inverse (integers in this unit).
- Students can recognize that the absolute value of the difference between two numbers as the distance between two points on the number line.
- Students can recognize the meaning of the absolute value within the context of the scenario.
- Students can use a number line to represent the addition or subtraction of integers.
- Students can perform operations with absolute value.
- Students can add and subtract multiple integers with and without context.

Special Note: Special emphasis in this standard on horizontal and vertical number line diagrams. Instructional Resources Mathematics Formative Assessments (MFAS) Lesson Resources Exploring Additive Inverse Describe a student-generated example McGraw-Hill of additive inverse and demonstrate on a number line. • Course 2, Chapter 3 Adding Integers Add integers using a vertical and horizontal number Illuminations line. 0 Zip, Zilch, Zero Add and subtract positive and negative Rational Addition and Subtraction Rewrite a subtraction numbers involving both strategy and luck in this card game problem as an equivalent addition problem and explain the equivalence to build understanding of additive inverses, adding integers, using a number line. and absolute value. Finding Difference Find the difference between two integers using a Using an Elevator to Evaluate Signed 0 number line. Number Expressions: Elevator Arithmetic Use vertical movement of an elevator to evaluate signed Illustrative Mathematics Assessment Tasks number expressions. Bookstore Account Use algebra and the number line to understand Using an Elevator to Evaluate Signed why it makes sense that we sometimes represent debt using negative Number Expressions: Flipping the Integers numbers. Adapt expressions that add or subtract two signed integers. Difference of Integers Subtract integers in a real world context. **CPalms** Distances on a Number Line 2 Reinforce understanding of **Discovering Our Addition of Integer Rules** 0 rational numbers as points on the number line and visually understand that

the sum of a number and its inverse is zero. Operations on the Number Line Solidify understanding numbers		Develop the rules for adding integers by using the absolute value of integers and number lines.
as points on a number line and understand the geometric interpretation of	0	Money Matters: Integers are Integral Design
adding and subtracting signed numbers.		and develop a working budget for a one-month period after
		learning to add and subtract integers.
	0	Math Match Review math concepts, including
		shapes, shape names, addition, multiplication,
		negative numbers, and equivalent expressions.
	0	Integers Jeopardy Game This game has 4
		categories: adding integers, subtracting integers,
		multiplying integers, and dividing integers. Students can
		play individually or in teams.
	 MARS/ 	/Shell
	0	Using Positive and Negative Numbers in
		Context. Use directed numbers in context. Identify and
		aid in ordering, comparing, adding, and subtracting positive
		and negative integers.
	0	A Day Out Task Analyze the results of a survey in
		order to plan a school trip.

MAFS.7.NS.1.2

- Students can multiply and divide integers.
- Students can use properties, like the distributive property, to calculate using integers.
- Students can interpret the products and quotients of integers in context.
- Students can understand that the divisor cannot be zero for a division problem.
- Students can interpret how to place the negative in a division problem like -(p/q)=(-p)/q=p/(-q).

Instructional Resources Mathematics Formative Assessments (MFAS) Lesson Resources Negative Times Given an illustration of why the product of two McGraw-Hill negatives is a positive, provide a rationale. • Course 2, Chapter 2 Quotients of Integers Given an integer division problem and asked Illuminations to identify fractions which are equivalent to the division problem. Multiplying Integers Using Videotape Explore 0 Integer Division Describe a real-world context for a given expression integer multiplication through the construct of videotaping. involving the quotient of two rational integers. **CPalms** Math Match Review math concepts, including Illustrative Mathematics Assessment Tasks 0 shapes, shape names, addition, multiplication, Distributive Property of Multiplication Study the distributive negative numbers, and equivalent expressions. property for products of whole numbers, focus on geometric relationships. Integers Jeopardy Game This game has 4 0 Why is a Negative Times a Negative Always Positive? categories: adding integers, subtracting integers, Understand the reason it makes sense for the product of two negative multiplying integers, and dividing integers. Students can numbers to be positive. play individually or in teams. Temperature Change Provide a context for interpreting division MARS/Shell expressions. Fencing Task Calculate the cost of building fences from 0 fence posts and wooden panels. **Better Lessons** Integer Product Signs-Using Counters to \cap Discover the Signs of Products Use integer counters to model products of positive and negative integers.

Learning Targets/F	oundational Knowledge	
MAFS.7.NS.1.3		
 Students can add, subtract, multiply and divide rational numbers (focus on integers) Students can solve real world problems with rational numbers (focus on integers). 		
Students can solve mathematical problems with r	rational numbers (focus on integers).	
Special Note: Students will go into greater depth	with other rational numbers in Units 16 and 17.	
Instructiona	Il Resources	
Illustrative Mathematics Assessment Tasks	Lesson Resources	
Products and quotients of signed rational numbers	McGraw-Hill	
Provide a context for multiplying and dividing signed rational numbers.	 Course 2, Chapter 3 	
	Illuminations	
	• Pick a Path Perform operations with rational numbers.	
	CPalms	
	 Math Match Review math concepts, including 	
	shapes, shape names, addition, multiplication, negative numbers, and equivalent expressions.	
	 Integers Jeopardy Game This game has 4 	
	categories: adding integers, subtracting integers, multiplying integers, and dividing integers. Students can play individually or in teams.	
	MARS/Shell	
	• Taxi Cabs Find the best way to organize cabs for a large	
	group of people.	

MAFS.7.EE.2.3

- Students can calculate using positive and negative numbers (integers) in multistep problems.
- Students can calculate using positive and negative numbers (integers) in real world multistep problems. Students can use mental math and estimation strategies to assess the reasonableness of a solution.

Instruction	al Resources
Mathematics Formative Assessments (MFAS)	Lesson Resources
Gas Station Equations Solve a multi-step problem involving percent. (Modify Word version of the task so that the numbers are integers.) Using Estimation Assess the reasonableness of answers using estimation strategies. (Modify Word version of the task so that the numbers are integers.)	 McGraw-Hill Course 2, Chapter 3 Illuminations <u>Big Math and Fries</u> This lesson is designed to enlighten on calculating percent of calories from fat, carbohydrates, and protein. Better Lessons <u>WP: Solve a Multi-Step Problem Involving Integers</u> Solve real world word problems involving integers and time conversions. MARS/Shell <u>Steps to Solving Equations</u> Form and solve linear equations involving factorizing and using the distributive law.

Grade 6 Math, Adv Unit 16: Rational Number		ers	Projected Time
Semester 2			Allotment: 9 Days
Sta	ndards/Learning Goals:	Content Limits,	Assessment Types, Calculator
MAFS.7.NS.1.1 Apply and extend previous understandings of addition		Numbers in ite	ms must be rational numbers: use
and subtraction to add and subtract rational numbers; represent		integers, decin	hals, and fractions.
addition and subtraction on a horizontal and vertical number line		0.75.	
diagram.		Limit fractions	to halves and fourths.
a. Describe situations	in which opposite quantities combine to	Calculator: NEUTRA	L
make 0. For examp	le, a hydrogen atom has 0 charge because	Equation Edito GRID	r
its two constituent	s are oppositely charged.	Multiple Choic	e
b. Understand <i>p+q</i> as	the number located a distance $ q $ from p,	Multiselect	
in the positive or n	egative direction depending on whether q	Open Response	e
is positive or negat	ive. Show that a number and its opposite		
have a sum of 0 (a	re additive inverses). Interpret sums of		
rational numbers k	y describing real-world contexts.		
c. Understand subtra	ction of rational numbers as adding the		
additive inverse, p	-a = p + (-a). Show that the distance between		
two rational numb	ers on the number line is the absolute		
value of their diffe	rence, and apply this principle in real-world		
contexts.			
Apply properties o	f operations as strategies to add and		
subtract rational n	umbers.		
MAFS.7.NS.1.2 Apply and	extend previous understandings of	Numbers in ite	ms must be rational numbers.
multiplication and division	and of fractions to multiply and divide	• 7.NS.1.2a,b,c r	equire the incorporation of a
rational numbers.	· · · · · · · · · · · · · · · · · · ·	negative value Calculator: NO	
a. Understand that m	ultiplication is extended from fractions to	Equation Edito	r
rational numbers b	by requiring that operations continue to	GRID	
satisfy the propert	ies of operations, particularly the	Matching Item	
distributive proper	ty, leading to products such as (-1)(-1)=1	Multiple Choic Multiselect	e
and the rules for m	nultiplying signed numbers. Interpret	Table Item	
products of rationa	al numbers by describing real-world		
contexts.	, ,		
b. Understand that ir	tegers can be divided, provided that the		
divisor is not zero,	and every quotient of integers (with no-		
zero divisor) is a ra	tional number. If p and q are integers, the		
-(p/q)=(-p)/q=p/(-q)	q). Interpret quotients of rational numbers		
by describing real-	world contexts.		
Apply properties of operat	ions as strategies to multiply and divide		
rational numbers.	c		
MAFS.7.NS.1.3 Solve real-	world and mathematical problems involving	Numbers in ite	ms must be rational numbers.
the four operations with ra	itional numbers.	 Complex fractions with 	ons may be used, but should contain single-digit numerators and
		denominators.	
		Calculator: NEUTRA	L
		Equation Edito	r
		Iviuitiple Choic Multiselect	e
		Table Item	

MAFS.7.EE.2.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hours gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or #2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.	 Numbers in items must be rational numbers. No variables. Items should require two or more steps. Calculator: YES Equation Editor Multiple Choice Multiselect
MAFS.7.RP.1.3 Use proportional relationships to solve multistep ratio and percent problems. <i>Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and</i>	 Numbers in items must be rational numbers. Units may be the same or different across two quantities. Calculator: YES
decrease, percent error.	 Equation Editor GRID Multiple Choice Multiselect Open Response Table Item

MAFS.7.NS.1.1

- Students can describe situations (in context) when opposite quantities combine to make 0.
- Students can recognize additive inverses.
- Students can recognize addition of positive or negative rational numbers as the movement in a positive or negative direction.
- Students can calculate using additive inverses.
- Students can interpret the sum of rational numbers in context.
- Students can interpret the sum of rational numbers on a number line.
- Students can recognize that subtraction can be written as adding the additive inverse.
- Students can recognize that the absolute value of the difference between two numbers is the distance between two points on the number line.
- Students can recognize the meaning of the absolute value within the context of the scenario.
- Students can use a number line to represent the addition or subtraction of rational numbers.
- Students can perform operations with absolute value.
- Students can add and subtract multiple rational numbers with and without context.

Special Note: Special emphasis in this standard on horizontal and vertical number line diagrams. Teachers will need to supplement the text to include practice with rational numbers in various forms within the same problem.

Instructional Resources		
Mathematics Formative Assessments (MFAS)	Lesson Resources	
Exploring Additive Inverse Describe a student-generated example of additive inverse and demonstrate on a number line. Adding Integers Add integers using a vertical and horizontal number line. Rational Addition and Subtraction Rewrite a subtraction problem as an equivalent addition problem and explain the equivalence	 McGraw-Hill Course 2, Chapter 4 Illuminations <u>Who Lost More?</u> Analyze ways for calculating weight loss. 	

using a number line.

<u>Finding Difference</u> Find the difference between two integers using a number line.

<u>Rational Water Management</u> Combine rational numbers, including fractions and decimals, and use the properties of operations to simplify calculations.

Illustrative Mathematics Assessment Tasks

<u>Comparing Freezing Points</u> Calculate the differences of signed numbers.

Differences and Distances Connect the distance between points on a number line with the difference between numbers.

Distances Between Houses Solve a problem involving distances between objects whose positions are defined relative to a specified location and to see how this kind of situation can be represented with signed numbers.

<u>Rounding and Subtracting</u> Addresses what happens to rounding discrepancies when arithmetic is performed on rounded numbers and would be a good problem for classroom discussion.

Distances on a Number Line 2 Reinforce understanding of rational numbers as points on the number line and visually understand that the sum of a number and its inverse is zero.

<u>Operations on the Number Line</u> Solidify understanding numbers as points on a number line and understand the geometric interpretation of adding and subtracting signed numbers.

CPalms

 <u>Add It Up with T-Charts</u> Use T-charts to add and subtract positive and negative numbers included mixed numbers and decimals.

MARS/Shell

- <u>A Day Out Task</u> Analyze the results of a survey in order to plan a school trip.
- <u>Taxi Cabs</u> Organize cabs for a large group of people.
- <u>Division</u> Look at problems in which the answer might be 100÷6. Decide whether this is true, and what would be a sensible answer to write down.

Yummy Math

 <u>Deflategate</u> Work with negative numbers, inequalities, and graph on the number line and use proportional reasoning to determine if an air temperature difference could have accounted for the deflated footballs.

Learning Targets/Foundational Knowledge

MAFS.7.NS.1.2

- Students can multiply and divide integers.
- Students can multiply and divide rational numbers.
- Students can use properties, like the distributive property, to calculate using rational numbers.
- Students can interpret the products and quotients of rational numbers in context.
- Students can understand that the divisor cannot be zero for a division problem.
- Students can interpret how to place the negative in a division problem like -(p/q)=(-p)/q=p/(-q).
- Students can convert a rational number into a decimal using long division.
- Students can identify whether the decimal form of a number as rational or not.
- Students can identify the characteristics of the decimal form of a rational number.

Instructional Resources

Mathematics Formative Assessments (MFAS)	Lesson Resources	
Initialities Formative Assessments (IVIFAS) Negative Times Given an illustration of why the product of two negatives is a positive, provide a rationale. Quotients of Integers Given an integer division problem and asked to identify fractions which are equivalent to the division problem. Understanding Products Explain why the product of a positive and a negative ration number is negative. Negative Explained Describe a real-world context for a given expression involving the product of two rational numbers. Applying Rational Number Properties Evaluate expressions involving multiplication or rational numbers and use the properties of operations to simplify calculations.	 McGraw-Hill Course 2, Chapter 4 Illuminations <u>Fun with Baseball Stats</u> Explore statistics surrounding baseball. MARS/Shell <u>Increasing and Decreasing Quantities by a</u> 	
	 Increasing and Decreasing Quantities by a <u>Percent</u> Interpret percent increase and decrease, and in particular, to identify and help students who have the following difficulties: Translating between percents, decimals, and fractions. Representing percent increase and decrease as multiplication. Recognizing the relationship between increases and decreases. 	
Illustrative Mathematics Assessment Tasks Products and Quotients of Signed Rational Numbers Provide a context for multiplying and dividing signed rational numbers, providing a means for understanding why the signs behave the way they do	Better Lessons <u>Two Suggestions for Father's Day</u> Asks students to change the amount in a blueberry muffin recipe to multiples of and fractions of % cup measuring cup	

MAFS.7.NS.1.3

- Students can add, subtract, multiply and divide rational numbers
- Students can solve real world problems with rational numbers.
- Students can solve mathematical problems with rational numbers.

Special Note: Teachers should not limit student practice to fractions. Students should receive practice with rational numbers in various forms within the same problem to address this standard.

Illustrative Mathematics Assessment Tasks		Lesson Resources
A Rational Number Expression Evaluate an expression with	•	McGraw-Hill
integers and decimals.		 Course 2, Chapter 4
Monitoring Water Temperatures Evaluate expressions with	•	CPalms
positive and negative integers and decimals. <u>Trail Mix Munchies</u> Calculate using division with fractions and mixed numbers.		 Pricing the 12 Days of Christmas Discover how much the items in the classic song, "The Twelve Days of Christmas", would cost in the current year; and then they will update the list for modern times.
Illustrative Mathematics Assessment Tasks	•	Yummy Math
Sharing Prize Money Reason abstractly about fraction multiplication as it would not be realistic for them to solve it using a visual fraction model. Products and Quotients of Signed Rational Numbers Provide a context for multiplying and dividing signed rational numbers, providing a means for understanding why the signs behave the way they do when taking products		 LegOS Estimate costs for the materials to build the World's Largest Lego tower.

Learning Targets/Foundational Knowledge

MAFS.7.EE.2.3

- Students can calculate using fractions, decimals and whole numbers in multistep mathematical problems.
- Students can calculate using fractions, decimals and whole numbers in multistep real world problems.
- Students can apply properties to calculate multistep mathematical problems with positive and negative rational numbers in any form.
- Students can apply properties to calculate multistep real world problems with positive and negative rational numbers in any form.
- Students can convert between forms of numbers.
- Students understand when conversion between forms of numbers is appropriate.
- Students can use mental math and estimation strategies to assess the reasonableness of a solution.

Instructional Resources		
Mathematics Formative Assessments (MFAS)	Lesson Resources	
Alexa's Account Assesses the reasonableness of an answer using mental computation and estimation strategies. Reeling in Expressions Solve a multi-step problem involving rational	 McGraw-Hill Course 2, Chapter CPalms 	
Discount and Tax Solve a multi-step problem involving percent. Gas Station Equations Solve a multi-step problem involving percent. (Modify Word version of the task so that the numbers are integers.) Using Estimation Assess the reasonableness of answers using	 Math in Mishaps Explore how percents, proportions, and solving for unknowns are used in important jobs. Uncle Henry's Dilemma Interpret data sets, which include temperature, rainfall, air pollution, travel cost, flight times and health issues to rank five global locations for the 	

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estimation strategies. (Modify Word version of the task so that the numbers			reading of his will.
are integers.)		0	Bargain Town, USA Participate in a simulated real-
			world exploration of the relationship between fractions.
Illustrative Methematics Assessment Tasks			decimals and percents by converting number forms and
mustrative mathematics Assessment Tasks			calculating discounted prices
How Fast is Usain Bolt? Involves multi-step conversions between			calculating discounted prices.
two rates, going from meters per second to miles per hour.		0	Percent of Change Investigate percent of change in
			real-world situations and differentiate between an increase
Allia III D.C. Solve a multi-step percentage problem that can be			or a decrease.
approached in many ways.		0	Here's A Tip Solve problems involving sales tax and
Discounted Books Explore ways to look at percentages both as a		0	ting: apply the properties of operations with numbers in
decrease and an increase of an original amount and turn a verbal description			desimal persent and fraction form
of several operations into mathematical symbols.			
Shrinking Estimate height based on percent decrease	•	Illumin	ations
Who is the Better Batter? comparing fractions using baceball		0	Big Math and Fries This lesson is designed to
vitions the Detter Datter: comparing fractions using basebail			enlighten on calculating percent of calories from fat,
statistics where it is natural to convert the fractions to decimals or describe			carbohydrates, and protein.
the situation in terms of percents.		0	Fun with Baseball Stats Explore statistics
Gotham City Taxis Solve a multi-step ratio problem that can be			surrounding baseball
approached in many ways.	_	Vueno nos	v Moth
	•	rumm	y wath
		0	Jock Tax Consider the differences in state taxes that high
			paid pro athletes pay and determine how much more
			money an athlete should be paid in a high tax state in order
			to offset the taxes.
		0	Shopping Season Begins Analyze shopping trips
		0	after calculating savings in dollars and percents
		D	
	•	Better	Lessons
		0	WP: Solve a Multi-Step Problem Involving
			Integers Solve real world word problems involving
			integers and time conversions.

Learning	Targets,	/Foundational	Knowledge
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MAFS.7.RP.1.3

•	Students can use	proportional	relationships	s to solve multi	step ratio problems.
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Mathematics Formative Assessments (MFAS)	Lesson Resources
Finding Fees Complete a multi-step percent problem.	McGraw-Hill
Tiffany's Tax Calculate the amount of sales tax and total price, given prices of individual items to purchase. Gasoline Prices Calculate the percent of change of gas prices. Making Cookies Find proportionally equivalent values given a set of rational number quantities.	 Course 2, Chapter 4 Illuminations <u>Understanding Rational Numbers and</u> <u>Proportions</u> The three activities in this investigation center on situations involving rational numbers and
Illustrative Mathematics Assessment Tasks Anna in D.C. Solve a multi-step percentage problem that can be approached in many ways. Lincoln's Math Problem Solve a multi-step problem involving simple interest. Buying Protein Bars and Magazines Solve a multi-step problem involving sales tax. Comparing Years Explore percent decrease between the larger and smaller value is to conclude that it is not equal to the percent increase between the smaller and larger value. Gotham City Taxis Solve a multi-step ratio problem that can be approached in many ways. Friends Meeting on Bikes Solve a multi-step problem by calculating speed given distance and time. How Fast is Usain Bolt? Involves multi-step conversions between two rates, going from meters per second to miles per hour.	 proportions that students encounter at a bakery. Invest in Your Education Given a budget, students purchase the common items used in their mathematics classroom and work with coupons when making purchases. CPalms In Whose Best Interest is Interest? Explore real world examples of interest rates. Summer Camp Fun (Model Eliciting Activity (MEA) Work in groups to rank summer camps: Calculate the discounted price of each camp, the number of weeks they can attend each camp based on budget and rank each camp. Write a letter giving their procedures and explanation of the strategy they used.

Tax and Tip Calculate the total cost including tax and tip given a	
subtotal.	
The Price of Bread Calculate the percent increase and relative cost in	
a real-world context.	

Grade 6 Math, Adv	Unit 17: Expressions		Projected Time Allotment: 9 Days
Sta	ndards/Learning Goals:	Content Limits,	Assessment Types, Calculator
MAFS.7.EE.1.1 Apply prop subtract, factor and expan coefficients.	erties of operations as strategies to add, d linear expressions with rational	Numbers in ite Expressions mu Calculator: YES Equation Edito Multiple Choic Multiselect Open Response	ems must be rational numbers. ust be linear and contain a variable. or e
MAFS.7.EE.1.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiplying by 1.05".		Numbers in ite including integ Expressions m Calculator: NEUTRA	ens must be rational numbers, ers, fractions, and decimals. ust be linear. L
		 Equation Edito Multiple Choic Multiselect Open Response 	r e e
MAFS.7.NS.1.3 Solve real- the four operations with ra	world and mathematical problems involving ational numbers.	 Numbers in ite Complex fracti fractions with denominators. 	ems must be rational numbers. ons may be used, but should contain single-digit numerators and
		Calculator: NEUTRA	L
		 Equation Edito Multiple Choic Multiselect Table Item 	e

MAFS.7.EE.1.1 Apply properties of operations as strategies to add, subtract, factor and expand linear expressions with rational coefficients.

- Students can evaluate linear expressions.
- Students can combine like terms.
- Students can create equivalent expressions.
- Students can factor expressions, i.e. using the distributive property.
- Students can expand expressions.
- Students can add and subtract linear expressions.
- Students can apply properties (associative, distributive, commutative, identity, etc.) to expressions.

Special Note: Be sure to supplement rational coefficient problems in this unit. The textbook does not include many problems with fractions or decimals.				
Instructional Resources				
Mathematics Formative Assessments (MFAS)	Lesson Resources			
Equivalent Perimeters Students are asked to solve a geometric problem by simplifying an algebraic expression. Equivalent Rational Expressions Students are given a polynomial with rational coefficients and asked to identify equivalent expressions from a given list. Factored Forms Students are given two expressions and asked to rewrite each in factored form using the fewest number of terms. Identify Equivalent Multistep Expressions Students are given an expression and are asked to identify expressions equivalent to it. Illustrative Mathematics Assessment Tasks	 McGraw-Hill Course 2, Chapter 5 Illuminations <u>Distributing and Factoring Using Area</u> Expressions representing area of a rectangle are used to enhance understanding of the distributive property. CPalms 			
	 Total Recall Using the notion of a broken robot, this lesson provides opportunities for students to apply different strategies and properties to expand, add, subtract, or multiply to determine equivalent expressions. 			
Ticket to Ride The purpose of this instructional task is to illustrate how different, but equivalent, algebraic expressions can reveal different	MARS/Shell			

information about a situation represented by those expressions.		
Writing Expressions The instructions for two expressions sound very		
similar, however, the order in which the different operations are performed		
and the exact wording make a big difference in the final expression.		

0	Steps to Solving Equations Students match
	equations to stories and then order the steps used to solve
	these equations.

MAFS.7.EE.1.2

- Students can represent problems as mathematical expressions when displayed as verbal expressions, tape diagrams or other representations.
- Students can use properties to rewrite expressions.
- Students can combine like terms to create equivalent expressions.
- Students can interpret the meaning of combined terms within the context of a problem.
- Students can determine and interpret the relationship between quantities within the context of a problem.

Instructional Resources

Mathematics Formative Assessments (MFAS)	Lesson Resources
Rectangular Expressions Students are given equivalent expressions with rational coefficients and asked to explain what each expression represents within the context of the problem. Explain Equivalent Expressions Students are given equivalent expressions with rational coefficients and asked to explain what each expression represents within the context of a problem.	 McGraw-Hill Course 2, Chapter 5 Illuminations <u>Interpreting Algebraic Expressions</u> This lesson unit is intended to help you assess how well students are able to translate between words, symbols, tables, and area representations of algebraic expressions.
<u>Illustrative Mathematics Assessment Tasks</u> <u>Ticket to Ride</u> The purpose of this instructional task is to illustrate how different, but equivalent, algebraic expressions can reveal different information about a situation represented by those expressions. <u>Writing Expressions</u> The instructions for two expressions sound very similar, however, the order in which the different operations are performed and the exact wording make a big difference in the final expression.	

Learning Targets/Foundational Knowledge

MAFS.7.NS.1.3

- Students can add, subtract, multiply and divide rational numbers.
- Students can evaluate real world problems with rational numbers.
- Students can evaluate mathematical problems with rational numbers.

Instructional Resources

Mathematics Formative Assessments (MFAS)	Lesson Resources
Explain Equivalent Expressions Students are given equivalent expressions with rational coefficients and asked to explain what each expression represents within the context of a problem.	 McGraw-Hill Course 2, Chapter 5 BetterLesson <u>Expressions Applications</u> Area and perimeter are great ways to model operations with expressions – and this lessons investigates just that! <u>Distributive Property – Practice Makes Perfect</u> Practice makes perfect! Students will color their way to perfection with the distributive property